The Boston Medical and Surgical Journal

TABLE OF CONTENTS

August 31, 1916

MASSACHUSETTS MEDICAL SOCIETY.

PAPERS READ BEFORE THE SECTION OF TUBERCULOSIS, JUNE 6, 1916.
CONTACT POINTS BETWEEN PULMONARY TUBERCULOSIS AND SYPHILIS. *By James A. Lyon, M.D.*, Rutland, Mass. 285
TUBERCULOSIS CARRIERS. *By Charles E. Perry, M.D.*, Northampton, Mass. 292
WHAT CONSTITUTES CLINICAL TUBERCULOSIS IN ADULTS? *By George L. Schadt, M.D.*, Springfield, Mass. 298

MEDICAL PROGRESS

ELEVENTH REPORT OF PROGRESS IN ORTHOPÆDIC SURGERY. *By Robert B. Osgood, M.D.; Robert Soutter, M.D.; Hermann Bucholz, M.D.; Harry C. Low, M.D.; Murray S. Danforth, M.D.;* Boston (Continued) 300

BOOK REVIEWS

Emergency Surgery. By John W. Sluss, M.D. 314
Practical Cystoscopy and the Diagnosis of Surgical Diseases of the Kidneys and Urinary Bladder. By Paul M. Pilcher, M.D. 314

EDITORIALS

THE LATEST THING IN CRUTCHES 315
THE EFFECT OF THE WAR ON THE YOUNGER GENERATION IN GERMANY 315
MEDICAL ASPECTS OF SHAKESPEARE'S GENIUS 316
MEDICAL NOTES 318

MISCELLANY

CHANGES IN THE MEDICAL CORPS, U. S. NAVY 319
NOTICES, APPOINTMENTS, RECENT DEATHS, ETC. 320

Massachusetts Medical Society.

PAPERS READ BEFORE THE SECTION OF TUBERCULOSIS, WITH THE DISCUSSION, JUNE 6, 1916.

CONTACT POINTS BETWEEN PULMONARY TUBERCULOSIS AND SYPHILIS.

BY JAMES A. LYON, M.D., RUTLAND, MASS.

IN searching through the voluminous literature on the subject of pulmonary syphilis, one is amazed and bewildered by the diversity of opinions held by the medical profession on this important and, to me in the light of my experience, unusual and uncommon condition. It has been frequently suggested to me that a large percentage of the cases at Rutland would be found to possess definite pulmonary syphilitic lesions, were a careful and diligent search instituted. To test this supposition 471 of our patients have been subjected to the Wassermann test. The results of these tests, together with a study of their clinical significance, form a part of this paper.

The credit for the first anatomical description of pulmonary syphilis must be given to Depaul who, in 1853, read before the Paris Academy a paper entitled "A Manifestation of Congenital Syphilis, Consisting in an Alteration of the Lungs Not Yet Described." Virchow was inclined to express himself with considerable reserve about the disease and was doubtful as to most of the cases that had been previously reported. He mentions having observed certain lesions of the lungs which he considered syphilitic, particularly so if there were other manifestations of syphilis elsewhere in the body. The most marked lesions that he found were a fibrous interstitial pneumonia along the bronchi, leading to the formation of fibrous bands passing from the centre of the lung along the bronchi and vessels toward the periphery, thus forming by their contraction more or less deformity of the lung. Along with this condition he believed that in certain cases there was an associated pleurisy, later on forming fibrous nodules beneath the pleura. He states that caseous pneumonia and gummata might also be discovered, and describes cavities formed from the breaking down of foci of caseous pneumonia, thus bringing up the question of syphilitic phthisis. All subsequent descriptions of the disease are based on this work of Virchow.

Carlier, in 1882, collected 75 cases from different sources, and of these he reported the autopsy findings in 50. Hiller, in 1884, collected 87 cases, 84 of which were examined post-mortem. Of these Carlier had previously reported 20. Hiller himself reported two cases in which syphilis of the lungs was undoubtedy present, there being also other evidences of syphilis. He is positive in his denial of the existence of a syphilitic phthisis and he believes that the cavities found in the cases reported should be considered bronchiectatic and not syphilitic. From the description of these cavities he was in all probability correct in his theory. Only 28 of the 84 cases of Hiller with autopsies should be considered as syphilitic, the doubtful cases in all likelihood being pulmonary tuberculosis with fibrosis.

All authorities, with almost the single exception of Pancritius, agree that pulmonary syphilis is rare. Most of the cases that he reported are clinical and consist of rather indefinite pulmonary lesions, with frequently obscure general manifestations of syphilis which responded to iodide of potassium. From the report of the autopsies which he gives it would appear that most of his cases were also ones of tuberculosis.

West maintains that out of 6000 syphilitic patients treated at the hospital in Copenhagen during a period of seven years, only 2 furnished clinical evidence of pulmonary syphilis. He also states that of 18 autopsies of adults who died of acquired syphilis, specific disease of the lungs was found in but three instances. Out of 105 autopsies on children with congenital syphilis the lungs were affected in but four instances. Lenhartz states that his teacher, E. Wagner, could recall but one instance in which he could make a clinical diagnosis of pulmonary syphilis, and in which a cure followed anti-luetic treatment.

Fowler maintains that pulmonary syphilis is a rare disease, and bases his statement on the fact that he was able to find only 12 specimens in the museum of the London hospital of the Royal College of Surgeons. He contends that two of these may be excluded as either not of that nature, or of a character so doubtful that they are inadmissible as evidence. None of these specimens is from a case of congenital syphilis.

Councilman, who reports two cases with autopsy, states that the essential process in the production of a gumma in the lung is a pneumonia with fibrinous exudation, accompanied by a fibrous change in the alveolar wall, the whole subsequently undergoing caseation. A hyaline degeneration of the capillaries of the affected area is stated to be the first step in the process; this is followed by atrophy of the alveolar wall. The alveoli become distended with large pale epithelial cells and fibrin; the cells also undergo hyaline degeneration, forming smooth bodies staining with eosin and varying in size from one-half the diameter of a red blood corpuscle up to that of a large epithelial cell. The capillaries become converted into rigid tubes and their lumen is much narrowed. Similar changes occur in the small veins and arteries. Immediately around the bronchi and arteries there is a formation of connective tissue, and here the alveolar walls show much thickening and contain small round cells. The whole of the structure thus altered tends to undergo necrosis, and when that change is complete a caseous-looking mass results.

Of cases of acquired syphilis of the lungs there are two varieties. In one there are gummata which vary considerably in size and frequency. They may range from one eighth of an inch to several inches in diameter, and there may be one or several of such masses scattered throughout the lung. In their incipient stage they are elastic and of a whitish or reddish-white color. At a later period they may undergo caseation and soften, or even become of firmer consistency. Accordingly gummata appear so like tuberculous masses that to differentiate them is a difficult problem. They are located in the interstititial connective tissue surrounded by a dense fibrous capsule. It is maintained by some that these gummata may soften and break into a bronchus and thus be discharged, thereby developing a cavity. Osler believes that when such a condition does occur it is caused by the action of tubercle bacilli. Usually these gummata are converted into dry, firm, cheesy masses, or else they undergo transformation into interstitial tissue. In the post-mortem examination of patients dying in the tertiary stage of syphilis stenosis of the small and large bronchi has been found, due to cicatricial contraction. These gummata may undergo fibrous changes, their resulting cicatricial contraction producing stenosis of the bronchi which, if complete, causes atelectasis of the air cells supplied by the stenosed bronchus, while a bronchiectasis may develop on the tracheal side of the stenosis.

The interstitial hyperplasia appears to have no characteristics which would in any way distinguish it from fibrosis due to tuberculosis, except in that it seems to have a tendency to be confined to one lung. This fact has been brought out very clearly by radiographs shown to me a few days ago by Dr. Holmes at the Massachusetts General Hospital. These were proven cases of syphilis, and the diagnosis of syphilis of the lungs was suspected. In one instance there was a marked destructive condition of the whole of the left lung with no apparent involvement of the other, a condition which would not be apt to occur in a given case of pulmonary tuberculosis, because of the improbability of the opposite lung escaping infection. In another case there were two well defined areas, one occupying the upper portion of the left lung, and the other located in its lower portion. These areas were clean cut and the rest of the lung was not affected, nor were there any evident lesions in the right lung. One would hardly expect to find such a condition existing in pulmonary tuberculosis.

The clinical picture produced by syphilitic disease in the lungs is rather indefinite and depends to a great degree upon the extent of the disease process. It is doubtful if a single gumma would produce symptoms unless it should be of sufficient size, or located in such a position as to cause pressure on important blood-vessels, or large bronchi. Likewise, the presence of interstitial changes at the root, or in the interior of the lung, is hardly likely to produce symptoms unless it is sufficiently extensive to interfere with the respiratory capacity.

There is a class of cases, however, in which the clinical picture of chronic phthisis is observed, and these are described by some authors as pulmonary syphilis. They occur in patients who present evidence of tertiary lues, or have been infected from 5 to 15 or 20 years previously. Whether the symptoms produced in such cases, however, are really due to syphilis is a much-disputed question, and one that has not so far been settled.

It is safe to state that the symptoms referable to pulmonary syphilis are not as a whole alike in every case, nor are they sufficiently characteristic as a group to make positive the diagnosis of syphilitic disease of the lungs, as differentiated from other pulmonary diseases. Indeed there are no symptoms distinctive of pulmonary syphilis.

In regard to syphilitic lesions of the bronchi, it seems of importance to bring out the fact that the signs of bronchitis which are found in the second stage are, as a rule, general in their distribution; while in the tertiary stage they are usually localized, owing to the tendency at that period to form interstitial changes or gummata in the bronchi. If stenosis occurs there may at first be bronchial breathing limited in area, and this may be found most frequently about the root of the lung posteriorly. As the capacity of the bronchi becomes narrowed, the respiratory murmur over the pulmonary area which it supplies becomes more and more altered until finally it disappears when the air ceases to pass the stenosis. If bronchiectasis occurs it will be followed by cough with profuse purulent and often foetid expectoration, and it is also accompanied by general constitutional disturbances, such as loss of weight and elevation of temperature.

Cough seems to be one of the earliest and most prominent symptoms in the cases reported in the literature on the subject. At first it is laryngeal, then it becomes tracheal or bronchial. Dyspnoea would appear to come next in point of frequency, and varies in severity according to the degree of the lesion. It may be mild when the process is slight, or very severe when marked fibrosis or stenosis of one of the main bronchi is present. The dyspnoea tends to become paroxysmal and to assume the character of bronchial asthma. Hemoptysis is not of frequent occurrence, but it may occur and prove fatal. Expectoration may be profuse, purulent, greenish or yellowish in color and offensive. It may also be streaked with blood. Foul expectoration is common in cases of advanced pulmonary syphilis. Pain may be present, but it is not so prominent a feature as in pulmonary tuberculosis. It is usually due to a syphilitic perihepatitis and not to pleural inflammation. Emaciation is not, as a rule, nearly so extreme and rapid as in tuberculosis, but with advanced lesions in the lungs the difference is not so remarkable as to be of any value from a diagnostic point of view. Night sweats may occur. Pyrexia may be present to a greater or less degree, depending upon the extensiveness of the pulmonary lesions. There may be a complete absence of fever in the early stages of the disease, and on the other hand it may assume the hectic type, as in tuberculosis, if the process is extensive.

The lesions of pulmonary syphilis are rarely of such a nature as to produce physical signs by which they can be distinguished from other pulmonary diseases of an entirely different origin. On inspection there is likely to be an altered appearance of the chest, depending upon the extent and location of the fibrosis, but it will hardly present the retraction of the apices so frequently seen in tuberculosis. If there are extensive changes in the lungs their expansion will be diminished, and there may be unilateral retraction like that seen in cases of fibrosis from other causes. Areas of consolidation and cavities will be recognized by the ordinary signs, probably long before syphilis is suspected.

A careful inquiry should be made into all cases of pulmonary disease as to the possibility of a latent syphilitic infection. It has been my experience in the routine taking of histories that almost invariably a patient will deny that he has ever had lues, and in many instances they are perfectly honest in their statement, because they have not known of the nature of their disease. At Rutland I am able to obtain a definite syphilitic history, in many instances only after the patient has been notified of the result of the Wassermann test.

Careful search should be made for syphilitic lesions in the calvarium, the sternum, ribs, testes, larynx, liver and spleen, and if there is a suspicion of syphilis the search should not be abandoned in a case of pulmonary disease with a positive, or even a negative, Wassermann without first having a careful radiograph taken of the lungs and the long bones.

In pulmonary tuberculosis the apices of the lungs are the parts most frequently affected, and the disease has a tendency to spread downward over a definite line of march. One lung is rarely found extensively diseased without an involvement of the other. The lesions of syphilis on the other hand seem to localize themselves about the root, base, and central portions of the lung, and they are, as a rule, confined to one lung, even when there is a marked destruction of tissue. Careful study of undoubted specimens of pulmonary syphilis, however, does not bear out the statement frequently made that the lesions are generally limited to the middle portion of the lung. They are so often found elsewhere that their more frequent occurrence in that part ceases to be a factor in diagnosis.

The presence of cavity signs in the lung and the expectoration of large amounts of sputum persistently negative to tubercle bacilli should always suggest pulmonary syphilis. In these cases and in all other doubtful ones an x-ray examination should be made by a skilled roentgenologist who has had considerable experience in the taking and interpreting of chest findings. The Wassermann test should, in my opinion, be given to every case presenting a pulmonary disease, and a negative finding after repeated tests should not necessarily be considered as evidence to exclude the possibility of a syphilitic origin. In all cases of pulmonary tuberculosis, which are at all doubtful, when the sputum is persistently negative, the subcutaneous administration of Koch's Old Tuberculin should be given in doses and periods laid down for that test. If the tuberculin reaction is negative, and there is a marked Wassermann reaction, and if the x-ray examination of the chest is confirmatory or suggestive, if lesions are found in the bones and there are other manifestations of syphilis present, a diagnosis of pulmonary syphilis would seem probable. On the other hand, if a positive reaction to tuberculin occurs in a given case of pulmonary disease with a marked positive Wassermann, it will be difficult indeed to make a correct diagnosis because the two diseases, pulmonary tuberculosis and syphilis, may co-exist while the x-ray examination may not be of assistance.

It has been suggested by some writers on this subject that if a pulmonary disease which has not responded to ordinary non-specific treatment were put on an anti-luetic treatment, and the process thereupon improved or disappeared, one would be justified in maintaining that the case was syphilitic. It will be noted that in the cases Numbers 1 and 2, here reported, the physical signs in the chest and the general condition showed striking improvement under nothing but the usual sanatorium treatment. Both of these patients had definite signs in the chest, and symptoms pointing to tuberculosis. An x-ray examination made in one of the cases showed an apical lesion. They had a positive and a doubtful Wassermann respectively and negative sputum. On the administration of 1 mgm. of Koch's Old Tuberculin they failed to react, as they did also to 3, 5 and 10 mgms. respectively. Both of these patients were referred to us from large hospitals. They had been examined repeatedly and considered to be tuberculous. During their stay in the sanatorium they have increased greatly in weight, and the physical signs have entirely disappeared. Had these patients been put on anti-luetic treatment and the same result had occurred, we are confident that we should have been disposed to credit the improvement to the therapeutic effect of the drugs. On the other hand, even in a given case of pulmonary syphilis where marked changes in the structure of the lung have taken place, with cavity formation, strictures of the bronchi, etc., one would not expect specific treatment to improve these conditions.

In still another instance (Case 3), where there were marked physical signs in the chest with a negative sputum on repeated examination and a positive Wassermann, the patient was put on specific treatment, mercurial inunctions and potassium iodide, and within a very few weeks the process in his chest became more active. He began to cough and expectorate large amounts of muco-purulent sputum which contained tubercle bacilli. The x-ray diagnosis in this case was pulmonary tuberculosis, involving the upper two-thirds of the left lung and the apex of the right.

Case 4 had well defined lesions in both lungs. His sputum was positive on admission, but was negative thereafter on repeated examinations. It was only a short time before his discharge that his blood was examined and found to be positive to the Wassermann reaction. This patient gained 26 pounds in weight during his residence, and at the time of his discharge his pulmonary disease was "apparently arrested." The x-ray report is as follows: "Dilated arch with dense mottled areas in both apices." If this patient had been given specific treatment and had made a similar improvement we might have considered that this was an instance of an associated pulmonary tuberculosis and syphilis.

CASE 1. Admitted January, 1916. Female, housewife. Age 28. Married. Family history, negative. Well as a child, with the exception of having had children's diseases. Menses established at 15, but have always been irregular. Was married ten years ago, and has a healthy, living child, aged 9 years. She has had no miscarriages. She gave a negative history to syphilis prior to the positive findings of her Wassermann test, but following this she stated that she had an eruption on her skin shortly following the birth of her child. She had no treatment for this condition. During the past several years she has had pain in her back, suffered occasional chills, gradual loss of strength, anorexia, constipation, and during the past few months has lost about 12 pounds in weight. There has been no cough or expectoration.

In December, 1915, she was treated at one of the hospitals in Boston, and a diagnosis of incipient tuberculosis was made and confirmed by the x-ray examination. The process at that time, so she was told, was in the right apex. Later she was examined at another hospital, and was advised to go to Rutland for treatment. Her application blank was marked "incipient."

On admission she complained of loss of strength, constipation, slight morning expectoration and pain in the back. Her temperature was 99° F. and her pulse was 102.

Physical Examination.—Fairly well developed; fairly well nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react. Nares, pharynx and larynx normal. There are several large and small scars about the shoulders and back, which are stated to have been caused by being scalded by hot water. There is no enlargement of the lymph nodes. The chest mobility and symmetry are normal. Heart normal. On percussion there is slight dulness in the right apex anteriorly extending down to the second rib, and posteriorly extending down to the fourth vertebra. Over this area there is broncho-vesicular breathing, and there are a few medium râles; the left apex is a little high pitched on percussion, and there are a few fine râles present.

The temperature throughout her stay ranged from 97 to 99° F.; her pulse has varied from 70 to 105, with a steady gain in weight and strength. The physical signs have gradually disappeared from her chest, and her sputum has been on repeated examinations negative to tubercle bacilli. On March 14, 1916, following the routine examination of patient's blood, she was found to have a positive Wassermann. Consequently, beginning on May 16, 1916, she was given 1, 3, 5 and 10 mgms. respectively of Koch's Old Tuberculin subcutaneously, and there was not the slightest local, focal, or general reaction. This was apparently not a case of pulmonary tuberculosis, and she was discharged with instructions to take specific treatment, having gained 15 pounds in weight.

Case 2. Admitted Feb. 11, 1916. Female. Housewife. Age 25. Married. Mother and father well. An only brother died of pulmonary tuberculosis two years previously. She was delicate as a child, having had pneumonia at the age of three months, diphtheria in childhood, measles, etc. Menses established at 14, irregular. Was married six years ago, and has two children living and well. She had an induced miscarriage two years ago, and has not been well since that time. She gave a negative history to syphilis on admission. During the past two years she has complained of a moderate cough and expectoration, together with pleural pains. She has been suffering from moderate dyspnea, and in May, 1915, she expectorated about a drachm of clear blood. The same thing occurred in January, 1916, but the blood then expectorated amounted to about one ounce. There has been a gradual loss of strength during the past two years. Her usual weight is 110 pounds, but on admission she weighed only 104 pounds.

She had been treated by various physicians and, during February, 1916, an application was made for her admission to the State Sanatorium by her physician, who stated that she was between the incipient and moderately advanced stages of her disease. The duration was stated to be two years, and the process was marked as being in the right apex anteriorly.

Her symptoms on admission consisted of moderate cough, moderate loss of strength, insomnia and moderate dyspnea.

Physical Examination.—Poorly developed and poorly nourished; attitude erect; color of lips pale; teeth fair; pupils equal and react. Lymph nodes negative. Nares, pharynx and larynx negative. Mobility and symmetry of the chest normal. Heart normal.

There is slight dulness in the right apex anteriorly, extending down to the third rib, and posteriorly extending down to the fourth vertebra; high pitched breath sounds and medium coarse râles are present over all this area.

During her residence her temperature fluctuated between 97.4° F. a.m., and 99.2° F. p.m., and her pulse varied between 70 a.m. and 106 p.m. She gained 10 pounds in weight. Her symptoms have all disappeared, and she is stronger and the physical signs in her chest are now negative.

She had a doubtful Wassermann on two examinations. Her sputum was negative to tubercle bacilli on repeated and careful examinations. On May 16, 1916, she was given 1 mgm. of Koch's Old Tuberculin subcutaneously, which failed to cause a reaction, and consequently she was given 3, 5 and 10 mgms. respectively, following which there was still no reaction. She was therefore discharged as non-tubercular, with the recommendation that she take specific treatment.

Case 3. Admitted October, 1913. Male. Age 20. Cook. Single. Family history, negative. As a child was delicate, and had the usual diseases of childhood. He denied having had syphilis. His present illness began in March, 1913, at which time he claims to have had a "touch of pneumonia." Since then he has been losing weight, has had a moderate cough and expectoration. He has had a slight evening temperature, night sweats and moderate loss of strength. On admission the foregoing symptoms were still present.

Physical Examination.—Fairly well developed and nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react; lymph nodes negative. The ears, nares and pharynx are normal. There is a slight thickening of both vocal cords, with moderate inflammation and catarrh. Mobility and symmetry of thorax normal. Heart normal. There are no scars of any kind upon the body. There is a slight incipient lesion in the right apex, with dulness in the left lung, extending down to the third rib anteriorly, and to the sixth vertebra posteriorly, in which area there are numerous râles, and also harsh breathing.

During the first few months of his residence he ran a rather irregular temperature and pulse. His sputum was persistently negative to tubercle bacilli. On Aug. 18, 1915, his Wassermann was positive, and on questioning him he admitted that he had had a primary lesion in 1912. He took "pills" for several months, and there were no secondary manifestations of the disease. Iodide of potassium was given, together with inunctions of mercury. Because of the "two-year residence rule," he was discharged as a patient in September, 1915, as "improved," and took up employment in this institution. Some time later he began to lose weight, his cough increased and he raised large amounts of muco-purulent sputum, which contained tubercle bacilli. The physical signs in his chest increased, and his temperature, which had been normal for several months, became elevated. The x-ray diagnosis was tuberculosis of the upper two-thirds of the left and the apex of the right lung.

Case 4. Admitted June, 1915, Male. Age 37. Printer. Married five years, no children. Family history negative. As a child was well, with the exception of diseases of childhood. He denied having had syphilis. His present illness dated from about one year back, at which time he began to feel run down. In January, 1915, he coughed and expectorated moderately, and later he complained of dyspnea, chills, moderate fever, night sweats, etc. On admission he had practically no cough or expectoration, and none of the above symptoms were present.

Physical Examination.—General development fair; well nourished; attitude erect; color of lips and mucous membrane normal; teeth, artificial uppers, lower ones in good condition. Mobility and symmetry of thorax normal. Heart normal. There are interstitial changes in the right lung, involving the upper and middle lobes anteriorly, and the upper lobe and upper half of the lower lobe posteriorly, with moderate activity. There are scattered deposits in the apex of the left lung, with slight activity. While under treatment he ran a practically normal temperature and pulse, and his sputum, although it was examined repeatedly, was found to contain tubercle bacilli only once during his residence.

On Oct. 2, 1915, his Wassermann was found positive, and he then informed us that he had had an initial lesion in 1900, for which he took mercurial pills for about one month. In March, 1916, an x-ray examination showed dense mottled areas in both apices. Diagnosis, pulmonary tuberculosis. He was discharged in March, 1916, having gained 26 pounds in weight, and the physical signs in his chest had entirely cleared up, there being nothing present but a few fibroid changes in the tops of both lungs.

Of the 471 cases having received the Wassermann test, 430 were negative, 10 were doubtful, 2 were unsatisfactory, and 29, or 6%, were positive. Of the 430 negative cases 140 had incipient pulmonary tuberculosis, 105 of these had repeated negative sputum, and 35 had positive sputum. Moderately advanced, 222, and of these 75 had negative sputum, and there were 149 instances where it was positive. The remaining 68 were far advanced; and of these 7 were negative, and 61 had positive sputum. The sputum was negative in 4, and positive in 2 of the doubtful cases in the incipient stage; 2 had negative and 2 had positive sputum in the moderately advanced stage. There were no doubtful cases in the far advanced stage of their pulmonary disease. Of the 2 unsatisfactory cases, both of which were in the moderately advanced stage, one had a positive sputum and the other was negative.

A positive Wassermann was obtained in 10 incipient cases, and of these cases 8 had negative sputum and 2 positive sputum. In the moderately advanced stage, 4 had negative and 11 positive sputum. In the far advanced stage there were only 4 that gave a positive Wassermann, and in each instance the sputum was positive.

From my experience at Rutland, and the careful consideration of the cases there, I am firmly convinced that all patients who are suffering from diseases of the lungs should be given repeated Wassermann tests. It is by this method, together with a careful study of the x-ray findings and physical signs in these organs, that we may hope to settle this difficult and complex question of what really constitutes clinical pulmonary syphilis.

DISCUSSION.

Dr. W. A. Hinton, Cambridge: I am much pleased with the points Dr. Lyon brought out in his paper, especially the description which he gave of the pathology of the disease. In a review of more than 5,000 autopsies, I do not recall a single case where the diagnosis of syphilis of the lungs was made in an adult. There is a good deal of work to be done on the disease, and we cannot be absolutely certain that lesions of the lungs which we think are syphilitic are such until spirochetes are found.

In regard to the incidence of syphilis among the tuberculous, out of 1164 cases examined by the State Wassermann Laboratory from patients in the Boston Consumptives' Hospital and in Rutland, 105, or 9%, gave positive reactions; 49, or 4.5%, doubtful reactions. These Wassermann tests were done as a routine in these two institutions. It is of interest to compare these statistics with others. In the case of the Lying-in Hospital, in 1130 cases about 5.9% were positive and an equal per cent. were doubtful. It would seem to indicate that roughly from 5 to 7% of the inhabitants of Massachusetts are syphilitic. I take the statistics of the Boston Lying-in Hospital as giving the average, as these people apply for a specific complaint—pregnancy—and no diseased condition. On the other hand, in general hospitals, about 20% of all patients give a positive Wassermann.

As bearing upon the relative frequency of a negative or positive sputum in the cases with a positive Wassermann test, the following statistics will give some information: In the Boston Consumptives' Hospital and Rutland State Sanatorium in 67 positive Wassermanns, 35 had a positive sputum and 32 had a negative. In 707 negative Wassermanns, 364 had a positive sputum and 343 had a negative. In other words, there is no more likelihood of finding a positive Wassermann in cases with a negative sputum than in cases with a positive sputum.

In conclusion, I wish to emphasize Dr. Lyon's point to the extent of saying that I believe that all patients, whether private or institutional, who have a diagnosis suggestive of pulmonary involvement, should have a Wassermann test performed.

Dr. C. Morton Smith, Boston: This subject was first brought to my attention about twelve or fifteen years ago, when a patient of mine, definitely luetic, who had been under treatment for a matter of three or four years, fell overboard down the Harbor one day in June. The wetting and exposure were followed by an attack of pleurisy, according to his description. Two or three months later he applied at one of the hospitals for a chest examination, and was recommended to a State sanatorium as a case of incipient tuberculosis. He remained at the institution about ten months, and during that entire period had a persistently negative sputum. It was before the days of the Wassermann test. The guinea-pig inoculated with his sputum in December was killed the following June, and, at the post mortem, showed no evidence of tuberculosis.

As far as diagnostic signs on physical examination are concerned, it seems impossible to distinguish, from physical examination alone, a case of syphilis of the lung from tuberculosis, judging from the cases that have proven to be definitely syphilitic; for practically all these cases have either been recommended to, or have spent a certain time in, one of the State sanatoria, having been sent there by experts. It seems to me that the x-ray furnishes one of the most valuable aids in the matter of diagnosis. The distinctions have been brought out by the reader, and I will not dwell on them.

Another point the reader mentioned is the well being of the individual with syphilis of the lung, as compared with the same degree of pulmonary involvement of tuberculosis. It seems to me that, in the matter of syphilis of the lung, the Wassermann is of about the same value as it is in other questions of syphilitic involvement. It is not so much a test as an additional symptom or sign of the disease. When we realize that the Wassermann reaction is positive in a large percentage of cases of leprosy, sleeping sickness, and certain other conditions, we see that it is far from a specific test. There are other temporary conditions in which the reaction is positive, such as certain febrile conditions, malaria at the time of the chill, pneumonia, scarlet fever, and sometimes after ether anesthesia. This winter at the Massachusetts General Hospital there were several cases of broncho-pneumonia that gave a varying degree of positive result, the reaction becoming negative, with no anti-syphilitic treatment, when the fever subsided. Probably other conditions, unknown at the present time, may give a temporary positive reaction.

There is one point not mentioned which I think is of value, and that is the need of performing the Wassermann test on other members of the family—the husband or wife, as the case may be. In cases where the patient fails to give a positive reaction, the mate may give a positive reaction in a fairly definite percentage. The same is true of examination of their children.

The x-ray plates, which Dr. Lyon speaks of as having been shown him by Dr. Holmes, were undoubtedly from one of our cases of congenital syphilis, where one lung is practically consolidated, while the other shows no evidence of involvement.

The persistent negative examination of sputum for tubercle bacilli is another striking point in this condition.

Dr. Hinton has probably given the correct solution of the failure of the pathologist to recognize this condition in the lung macroscopically. In the same way definite specific lesions of long bones are revealed by the x-ray alone.

In the matter of tuberculin tests, Dr. Otis published some cases several years ago where he did the tuberculin test on a certain number of definitely known luetics, with no signs of tuberculosis. As I remember it, he obtained about 33 1/3% of positive reactions in syphilis. That is interesting in connection with Dr. Lyon's observations that syphilis fails to give a positive reaction, even in large doses of the old tuberculin. I was interested in what Dr. Lyon said about the tuberculous process lighting up after the administration of mercury and potassium iodide. I was not sure that treatment of this sort would cause irritation or a lighting up of the tuberculous condition, but I am convinced that salvarsan has that effect. I am sure that I have lighted up tuberculous conditions from the injection of salvarsan in patients with a double infection. It seems to me that tuberculosis of the lungs is ordinarily one of the definite contra-indications to salvarsan. The consideration today deals with a definite luetic condition of the lung, not the combination of syphilis and tuberculosis. A certain number of luetics are going to become tuberculous, and a certain number of tuberculous individuals will acquire syphilis. These cases of syphilis of the lung that simulate tuberculosis are of particular interest.

I do not wish to enter into controversy with the laboratory men on the subject of Wassermann reactions, but I wish to reiterate once more the fact that the Wassermann reaction is not a specific test for syphilis; it is a group reaction.

All the patients with positive reactions, even though they may be moderate or weakly positive, are sent from the Lying-in Hospital to the Syphilis Department of the Massachusetts General Hospital for observation and treatment. There is a certain number of cases that are reported as "doubtful" or "suspicious." I do not understand that the *reaction* is doubtful or suspicious, but the *laboratory man* is in doubt as to whether that patient should be called *syphilitic* or not. It would seem that more help could be given the physician if the degree of positiveness of the reaction is reported, rather than the report "suspicious" or "doubtful." The moderate and weak positive reactions to the laboratory man mean a definite per cent. hemolytic reaction. When interpreting the Wassermann findings with the clinical signs on physical examination, it may be a resolving syphilitic infection, that gives you only a moderate or weak reaction, or perhaps the patient has been recently under treatment, and thus gives a moderately positive reaction, or it may be one of the *false* positives. It leaves one less in doubt to know the degree of positiveness.

DR. ROGER I. LEE, Cambridge: The pathology of syphilis and tuberculosis is very similar. We all know how common pulmonary tuberculosis is. On the other hand, our pathologists tell us that syphilis of the lung is very rare. The great difficulty from the clinical point of view comes from the question of diagnosis. We have no means of diagnosing syphilis of the lung in life. We cannot find spirochetes in the sputum. Even if we did they would probably come from the mouth and not from the lung. We are, therefore, thrown back on the Wassermann reaction, which, as Dr. Smith has pointed out, is, after all, not a specific reaction. The Wassermann test is of tremendous value, and, other things being equal, a positive reaction indicates syphilis. But in the presence of any very marked disease of any sort, one has to be a little chary about accepting a positive and especially a doubtful Wassermann reaction. Furthermore, the presence of a positive Wassermann reaction in no wise necessarily involves the lungs. It is a general reaction and not at all a local reaction in the lungs. We have a positive means of diagnosing tuberculosis of the lungs by finding tubercle bacilli in the sputum. On the other hand, the absence of tubercle bacilli from the sputum, even on repeated examinations, is of no great importance. If the search is persistent enough, we usually find tubercle bacilli. I should be very regretful if this section broke up with the idea that negative sputum examination for tubercle bacilli was of any real value in eliminating tuberculosis, and in suggesting that the disease was syphilis of the lung.

Dr. Lyon and the discussers have rather restricted the discussion to the question of the relation of tuberculosis and syphilis. It seems to me that it is very much wiser to accept the experience of everybody here that, pathologically, syphilis of the lung is very rare, that clinically it is certainly very rare; and to put syphilis down as one of the rare conditions of the lung. One has to admit that there are other rare conditons in the lung which may not be syphilis. Take, for example, pneumonitis, bronchiectasis or actinomycosis, that we occasionally see and cannot explain. In other words, there is a group of pulmonary conditions, usually localized in one lung, which are due to other agents, usually infective agents, than the tubercle bacilli. It seems to me that rather than to say that some chronic non-tubercular condition of the lung, even in the presence of a positive Wassermann reaction, is syphilis, we should say that the condition probably belongs to a rare group of lung infections, and syphilis is simply one of that group.

Dr. Abner Post, Boston: Some years ago I asked one of the gentlemen who had been prominent in anti-tuberculosis work what he knew about syphilis of the lung. He answered me something like this: that he knew there was syphilis of the lung, but did not know that he had ever seen it, and did not know how he should recognize it if he were to see it. We have advanced a little bit further than that. We know that there are certain cases of syphilis of the lung at the present day. We do not know how to distinguish them exactly from tuberculosis.

It is a fact that the advance in our knowledge of syphilitic phenomena has been due very largely to the clinicians. It was denied for some time that locomotor ataxia could possibly be of syphilitic origin, because its lesions were entirely different from those ordinarily attributed to syphilis, and the clinicians established the connection. I cannot but think that our knowledge of syphilis of the lungs must be acquired in the first place chiefly through clinical study, especially if we may include radiology as a part of the clinical study, rather than through pathology. It seems to me that in cases in which there are symptoms which simulate those of tuberculosis, but in which the lesions in the lungs are unusual, and in which tubercle bacilli are not found, with a positive Wassermann test, we should not make a hasty diagnosis of syphilis; but such cases should be regarded as possibly syphilitic, and from their study we shall learn what the clinical peculiarities are, and shall acquire at length a knowledge of syphilis of the lung which will be worth while.

TUBERCULOSIS CARRIERS.

By Charles E. Perry, M.D., Northampton, Mass.

In our campaign against tuberculosis we must consider the individual, the family and the public. Each is of nearly equal importance and their interests so closely allied that it is impossible to consider one without the other.

The individual's rights are to have his disease discovered at the earliest possible time and to have laid before him information concerning the possibilities of an arrest or cure if he follows the proper path, and the probable consequences if he fails to do so. He next should have an early opportunity of admission to a sanatorium, where he may be properly started on his way to health and receive an education that will be useful to him for the remainder of his life.

It is the right of the family to be protected from a source of infection and still not be deprived of the support of the wage earners, housekeepers or the comfort of loved ones for a longer period than is necessary.

The public rights should also be preserved, by protection from sources of infection, as well as by having the funds which the public provides for health work spent judiciously for the purpose for which they are intended.

At first thought, looking at tuberculosis as a communicable disease, it would seem that the problem could be solved by segregating those afflicted, but further reflection shows how obviously impracticable such a procedure would be in a State like Massachusetts, and also brings up the question as to the desirability of such a course.

It is the purpose of this paper to discuss what ought to be our attitude toward probably the largest proportion of those capable of disseminating the disease—the tuberculosis carriers. By the term carrier, we understand a person who harbors pathogenic organisms, but who himself shows no symptom of the disease.

We have no way of obtaining knowledge of the number of carriers in the State, but there must be many thousands. One of the commissions to investigate tuberculosis in Massachusetts a few years ago stated that tuberculosis is a disease of 40,000 persons, and each one of these probably is, or has been, a carrier some of the time, and it would seem that as our death-rate from tuberculosis decreases the number of carriers will increase. Because of the increasing national or racial immunity we seem to be acquiring, and because of higher standards of living, better housing and working conditions among the poor, and better care of consumptives, with earlier diagnosis and treatment, there will be a lesser tendency for infected persons to advance to the more rapidly progressive forms of the disease, but more of a tendency to establish a resistance which will keep them above the sick line, but still with the disease process active enough to furnish abundant bacilli in the sputum.

The question, then, seems to me to be how dangerous these positive cases really are, who are able to be about and perform more or less work in comparative comfort.

Tuberculosis is a disease in which infection by the specific organism is necessary to cause lesions. There are scientific and clinical reasons to suppose that hereditary and acquired predisposition is an important factor. All persons probably have a certain resistance to the bacilli, which varies from one which is very slight, to an almost, but presumably never absolute, immunity. So in a word, infection depends on the introduction of a sufficient dose of the infecting agent to overcome the amount of immunity possessed by the individual. This resistance depends on a great many factors. Age is an important one,—the older the person the higher the grade of immunity acquired through previous infections, but also to other factors, the nature of which are unknown, but shown by the fact that the older the individual the less liable he is to have acute miliary tuberculosis, which form the disease takes in susceptible animals and young children without immunity. We also note the fact that phthisis is less common in the aged, and when it occurs, runs a mild, benign course.

It is the opinion of many now that nearly all phthisis is the result of an endogenous infection or an extension from an old quiescent focus acquired in childhood, which is given an opportunity to light up when resistance is lowered, as from other acute infectious diseases, anemia, malnutrition, exposure, undue fatigue, worry, insanity, especially dementia precox, and possibly physical injury. Dr. Knopf in a recent article quotes at least ten well-known Americans of vast experience as being in accord with this view.

It has been shown by both autopsy findings and the use of tuberculin tests that very few individuals in modern civilized communities reach maturity without having been infected. The percentages vary from 50 to 98, probably differing on account of conditions under which subjects live. It has been shown that new-born infants are free from tuberculosis, and that the number of those infected increases with the age of the child, until at the age of fourteen or fifteen nearly as many are found infected as among adults.

From this it will be seen that nearly all who are infected at all, are infected before they reach the age of fifteen years. This would seem to prove that, in regard to prophylaxis, these children must be the ones to be especially protected, and the younger the child the more important the point, for, as has been shown, the younger the child, the more liable to fatal infection,—in fact children under two years of age seldom survive.

It should be a rule that all positive cases of tuberculosis should be removed from the home where there are children under fourteen years; the only exceptions being, possibly, in a family where there are plenty of funds and a high order of intelligence so there may be complete isolation of the patient, or where, for other reasons, it is more feasible to remove the child.

It may not be well to include all children under fifteen within this radical rule without further explanation. It will readily be admitted that because of the rapid form the disease assumes in children under four or five years of age and because such children have practically no resistance to the infection, absolute prevention of infection is desirable in these younger children. Fishberg states that "75% of children born during the last year of the mother's life, and 90% during the last month, succumb," and that "the exposure of an infant, even in an ideal home, may result in fatal tuberculosis, while life under adverse conditions will not produce tuberculosis unless there is a source, which is usually a human consumptive, and rarely milk derived from tuberculous cows."

It is at this period that there is the greatest danger from undiscovered carriers. Every one in the household wishes to fondle and kiss the baby and every one at times handles its food. Women are the most dangerous, because, as a rule, they are at home all day and have more ample opportunities for infecting food.

Before a child is born a careful examination should be made of every member of the household, and repeated sputum examinations made of all those who are in the least suspected. Particular attention should also be paid to the older members, as, for instance, the grandparents or others with chronic coughs which pass for bronchitis or asthma. In these cases the use of the antiformin method for sputum examinations is indicated. It is likely that in this way a great many carriers will be discovered.

All children should be protected from the over-affectionate visitors, who want to hold the baby or kiss or feed it. Children under three years of age should be kept at home and given no opportunities to acquire infection by travel or association with the public in crowded places.

Other children under fifteen, that is, those from three to fifteen years, we see from the study of statistics, are quite liable to infection, but it is usually of a milder sort and tends to affect tissues like bones and glands, in which the process tends to become quiescent; so here, general hygienic conditions and protection from other infectious diseases play an important part in preventing its development later into the phthisis of adults. Agreeing to this, we must not forget that these younger persons are still liable to the severer forms of the disease if the infection is massive enough or the resistance low enough. Such infection takes place only by intimate family association, as is probable in living with an open case of tuberculosis and indulging in kissing, handling of clothing and linen used by such cases, and by the ingestion of food touched by hands infected by tubercle bacilli.

Such intimate contact is not likely outside of the home, and such infection as occasionally occurs in ordinary associations is apt to be mild, and serves only as a means of immunizing the child by relatively harmless glandular tuberculosis. Indeed, this early immunization may be a saving factor in preventing us from becoming, as a race or nation, as susceptible to the rapid forms of tuberculosis as the new-born infant or the primitive races.

As a means to accomplish this separation of children from massive infection, and infants from any infection at all, we need something more than education, and advice by physicians and dispensary nurses. We need laws, and the enforcement of them by competent officials. Some of the money now spent by the public on the care of healthy individuals who may have tubercle bacilli in the sputum, but who have become institutionalized, or too lazy, selfish or unambitious to earn a living for themselves, could be well spent toward this end. Many who have tasted the pleasure(?) of free food and clothing from the board of health, and possibly a comfortable hospital bed during the winter, feel as one did I had the pleasure of knowing. He said "I have tuberculosis, and the public is bound to support me. The heaviest work I ever expect to do is to roll cigarettes." This patient was physically fit for a moderately hard day's work, although his sputum contained abundant bacilli. Such cases, as well as all incorrigible or unteachable consumptives, should be committed to a special hospital suitable for their care.

Now we come to the question of what are the dangers to adults from carriers of tuberculosis. We have seen that most of us have been infected, and therefore have acquired an immunity which is sufficient for all ordinary use. Those who have never been infected have also a certain amount of resistance, presumably due to maturity of tissues, as well as the immunity which is general to the white race, which will usually carry them safely through life, even though subjected to occasional slight exposures.

That infections of adults may occasionally take place there is to me no doubt, for if the soil is properly prepared, when enormous doses or even frequent small doses are received from without, why should infection not occur, as well as when received from within, from the breaking down of an old process?

Baldwin asserts that "in man no absolute immunity has been observed," but that "the grafting of new exogenous bacilli in the human being in adult life, nevertheless, requires a specially lowered health or enormous doses of bacilli."

The infrequency of conjugal phthisis and of infections occurring in persons of good health who work among consumptives show that adult infections are very unlikely. Statistics of the Brompton Hospital for Consumptives, compiled for periods before and after the discovery of tubercle bacilli, show that this condition is not due to increased care in disposal of sputum.

I can see no fair reason why carriers of tubercle bacilli, in a moderately good state of health, should not be allowed the privilege of almost any occupation not having to do with the handling of food that is not to be subsequently cooked, or those occupations requiring intimate personal service, or in certain dusty trades. Possibly the danger is slight in some instances, but it cannot be so with tuberculous milkers or restaurant waiters. It goes without saying that carriers should not be allowed in occupations that have to do with the care of children, such as teachers and nursemaids. Dusty occupations, particularly those in which metallic or mineral dust is involved, should be forbidden, both on account of the liability of infecting fellow-workmen under conditions which so favorably prepare the lungs for the reception of the bacilli, and on account of the unfavorable effect of dust on the lungs of the carrier himself.

I would conclude, then, from these facts that if we segregate or isolate the advanced and dying consumptives, from whence comes the bulk of infection, eliminate from children under three years of age all chances of contact with open cases or of the ingestion of milk from tuberculous cows, prevent massive infections in older children by avoiding too intimate contact with carriers, and by general hygienic methods, and avoidance of predisposing causes, reduce to a minimum the liability of infection developing into progressive disease, we are on fairly safe ground.

DISCUSSION.

Dr. Arthur K. Stone, Boston: Dr. Perry has defined the term "carriers" as "those persons who harbor pathogenic organisms"—in this case the bacilli of tuberculosis—"but who have otherwise shown no symptoms of the disease." To my mind, these carriers form a small and quite distinct group. They are, for the most part, well nourished, and show none of the ear marks of the ordinary tuberculous subject. With the exception that they cough and spit more or less, they have nothing to attract attention to themselves. Usually, it is only accidentally that they are found to be carriers of tuberculosis. Often, after a brief stay in a sanatorium, or possibly simply resting, they are practically well again, excepting that tubercle bacilli continue to be found. These men soon join one of two distinct groups. Either they accept the sanatorium treatment as a pleasure, described by Dr. Perry, or they demand to be free and allowed to work out in the community. Of the two, I believe that the first mentioned is the least dangerous to the community, and it is cheaper to support him in idleness than to have him at large with the chance of infecting several others that must be cared for by the State later on. Let me briefly explain what I mean by this. If the man is simply to be cared for the rest of his life, it should be in some institution where it can be done more cheaply than at the present sanatoria; where at least he shall have something to do in return for his keep. If he wishes to work, I believe in spite of all the difficulties involved to the institution, he should be allowed and encouraged to work at the hospital or sanatorium, in whatever capacity he is capable of serving.

Under certain conditions a man may be permitted to go home and to continue his work. Here the home surroundings, and his ability and willingness to protect others, must be carefully considered before this is allowed to take place. A part of this group belongs to the semi-criminal or alcoholic class,—men with no self-respect and absolutely no respect for the rights of others. This group is a definite menace to everybody and comes into the incorrigible class, for the care of whom something must be done in the near future. This is a very perplexing group to handle. Occasionally, in alcoholic cases, one of these men is committed to jail by a court sentence and then is automatically transferred to the tuberculosis prison camp at West Rutland, where he is held during the time of his sentence. Health officers everywhere should look out for any such person that they know of, and when they are in court inform the court officers of the presence of the tuberculosis, so that this transfer may take place. Some of them really learn something up there, and during their stay, at least, they are where they are no menace to the community at large.

A number of convalescent tuberculosis patients gradually pass into the carrier class, as Dr. Perry has described. Their lungs refuse to heal absolutely. Here I should counsel patience, and then more patience, in the hope that a final arrest will be obtained. If they must work, they should be given employment, so far as possible, in some institution, or under certain conditions; especially careful cases may be allowed to return to their old, or to some especially selected new, occupation. This should be permitted only with great reluctance, especially in those cases where there is any contact with children.

The question has been raised whether these persistent carriers are dangerous where the bacilli have become attenuated, and therefore nonpathogenic. There is nothing to prove that they are not dangerous. Typhoid fever carriers have been found to be persistently and constantly sources of new cases of typhoid. We must all bear in mind the story of Typhoid Mary. Many years ago I made a study of a number of cultures of diphtheria bacilli from a number of persons who had become clinically well of their diphtheria, and found that the diphtheria bacilli were active and very virulent. Dr. Theobald Smith, and Dr. Baldwin, of Saranac Lake, were written to on this subject. They replied that the statement that the bacilli of tuberculosis in carriers are non-virulent is quite unwarranted. Some bacilli, Dr. Smith said, might be considered to be attenuated, or atoxic, but the point could not be determined until cultures had been tested. Dr. Baldwin's reply was along the same line. Therefore, it is not possible to consider any of these carriers as non-infective, but we must consider them dangerous to the community at large.

Dr. Adam S. MacKnight, Fall River: It is very apparent that we must consider this "carrier" subject from different points of view. First, from the standpoint of the physician in charge of an institution; and second, from the standpoint of the physician in every day practice, who has to do with the patient in his home, in his social relationships, with his family. Dr. Perry spoke of the three-fold relationship,—the individual, the family, and the public. It is also apparent that these relationships must be dovetailed in a friendly, helpful way. In other words, the individual with an active tuberculous lesion has certain family ties, and certain duties to perform. There is no reason why tuberculosis should be the cause of upsetting all the relationships of life. In too many cases, when the note of tuberculosis is sounded in a family, it practically means a separation; certain "phobias" come into the minds of the friends and relatives, while the patient, who has his or her own troubles to consider, is sent away at an unripe or an unfit time, which, of course, subjects the family to all sorts of discouragement, and hardships. The individual, the family, and the public rights, must be considered. At the present time, it seems, we are just "waking up" to the public recognition, that the individual and the family rights must be protected, in the event of separation—due to tuberculosis.

We must not consider the "tuberculosis carrier" in the same class with the "diphtheria" and the "typhoid carrier." The relationship is entirely different. In the case of a tuberculous mother and child, realizing, as we all do, the danger to the child, we must take into account the terrible anguish that comes, when that child is taken away from the mother, or the mother from the child. Take the cases of glandular conditions without any open lesions. In the bone and gland tuberculosis, without any discharge, there is nothing to create the terror of the "carrier" theory.

I should like to differ from Dr. Stone in the way he would handle that "cigarette roller," mentioned in Dr. Perry's paper. I do not think the tuberculous individual of that type deserves any State recognition or, in fact, any recogniton whatever, whether he has a positive or a non-positive sputum. I think one of that type should be discharged from a sanatorium, and made to earn his living, and the place he occupied should be given to one of the opposite type—the one who wants to protect himself, his family, and the public. The sooner the public recognizes that condition, and deals in proper manner with the "cigarette roller," the better.

Dr. Perry's definition of a tuberculosis "carrier" is, in my opinion, open to question, and might be somewhat modified.

Dr. Charles J. Downey, Springfield: In rising to discuss this paper, I feel that we are all indebted to the author for his practical and sane treatment of the subject, and I wish only to emphasize a few points in connection with what he has already said.

Tuberculosis is a body infection. Consumption, phthisis, tuberculosis of the lungs is but the end-result, a final stage of a long-continued semi-pathologic process.

Tuberculosis is an infectious disease, with the infection being nearly always acquired in infancy or early childhood, attacking the lungs in later life, and producing the disease which has been recognized, so long as there has been civilization, as phthisis or consumption.

It is a disease which lasts a lifetime, beginning in infancy and ending in the grave. This being true, infancy and childhood is the field where the battle against tuberculosis must be most vigorously waged.

When we consider that about one-third of the country's population is made up of children under fifteen years of age, and when we consider also that upon the environment of childhood depends largely the physical and mental vigor of a nation, we cannot fail to realize the great importance of laying the foundation of an intellectual and vigorous race of people at the earliest date possible.

I agree with Dr. Stone that special hospital accommodations should at this time be speedily provided for the incorrigible and the unteachable cases, who are a menace to the public when at large. We must continue to give the milder adult cases prompt treatment, that the disease may be arrested so that they may return home to the support of their families in the least possible time. But when we touch the children, our duty becomes an all-appealing and a sacred one, and should be grappled with in a courageous manner and with a liberal supply of funds.

Poverty is the great associate of tuberculosis. Men on a laborer's wage increase their families more rapidly than they do their income, and they soon find that they have to feed, clothe and protect a family of six or seven on the same wage that a few years before was used for caring for two or three. The quarters are no larger; there consequently is smaller space for breathing per individual. There is breathing of expired air; the atmosphere is fouled.

The result of all this is diminished power of resistance and a greater susceptibility to disease, especially of the respiratory tract.

We have a problem of education of the families; a problem in home life. If a large percentage of our adult poor have tuberculosis it is mandatory that we all attack the problem in the home, where infection takes place at so early a period in life.

We have worked in the past according to the light we had. As we have become better informed and have had more knowledge on the subject, we must change our viewpoint; we must attack the problem in a new and a better way.

Dr. Francis P. McCarthy, Brighton, Mass.: In my two years at the Boston Consumptives' Hospital there were about 80 autopsies in tuberculosis. In two years in the Canal Service in Panama, I saw about 200 more autopsies in tuberculosis. In the past ten years there have been about 5000 autopsies done on a large number of cases, including over 1000 cases of advanced syphilis. There were no cases of pulmonary syphilis in this group of cases. The question comes up today as to whether the pathologist is overlooking syphilis of the lung. I do not think he is. Routine examinations frequently are made to find spirochetes in questionable lung nodules or in the walls of the bronchi. None have been found in these cases in question. The finding of treponema in the aorta and brain would indicate that we ought also to find these organisms in lung processes of syphilitic origin. The problem seems to be purely pathological. Until the pathologist reports increasing numbers of cases of syphilis of the lungs, the disease is still rare. If we discover in the future more cases of lung syphilis, as a result of pathological and bacteriological examination, then the disease is becoming more common. Last year at this meeting there were cases reported where patients in the active secondary stage of syphils had signs in the chest which might simulate tuberculosis, even to the expectoration of a certain amount of blood. This process in the chest is probably a bronchitis, with engorgement of capillary vessels of the bronchial mucosa, with rupture of these vessels, and of a transient nature, occurring in the secondary stage of the disease.

Dr. Hinton brought out the point that the finding of positive sputum and negative sputum in relation to the Wassermann test, is very important. In the positive Wassermann cases the sputum is not any more often found negative than in the negative Wassermann cases. I still think tht the disease, as Dr. Lee has brought out, is rare, and is not becoming more common, and until the disease is recognized at the postmortem, the clinician must keep the diagnosis of syphilis of the lung in abeyance.

Dr. E. O. Otis, Boston: I would like to emphasize Dr. Perry's very conservative and, in my opinion, just statement, that carriers who are able should not be prevented from engaging in any occupation, with the exception of such a one as would bring them into intimate contact with children. We talk very glibly about the isolation of the consumptive, and in certain cases this is the only obvious thing to do, as with the incorrigible consumptive. There are a large number of the active tuberculous individuals, however, whom we shall never be able to isolate, and it would be an unwarranted infringement upon their liberty if we could do so, for according to our Declaration of Independence, all men have the "inalienable right to life, liberty and the pursuit of happiness." However, the consumptive in his "pursuit of happiness" must not jeopardize the happiness of another. All we are warranted in doing is to educate the consumptive who is about among people so that he will not be a menace to others.

In our campaign against tuberculosis we have so alarmed the public that the poor consumptive is not infrequently made to suffer unreasonable hardship. I recall the case of an active tuberculous person of comfortable means for whom I tried to find a home. After vainly trying several private hospitals, she finally found a place in a hotel. Again, a single gentleman with advanced, active tuberculosis, and yet able to attend to his business, told me that he was living at one of the hotels in the city, as he considered that in this way he could best conceal the fact of his disease. As there was generally a new person in the adjacent rooms every night, his paroxysms of coughing were not complained of. It seems to me that we have got to accept whatever risk there may be in the tuberculosis carriers who are about, just as we take many other risks in life. We cannot isolate all active tuberculous cases or carriers. All we can do is to see that they are properly instructed as to the protection of others from their infection, and trust to their conscientious observance of the rules of prevention.

Dr. Cleaveland Floyd, Boston: This term "carrier" was originally applied to convalescent typhoid fever patients who were free from clinical symptoms and signs of the disease, but there was a carrying about of the organisms which could produce the disease in others. The word "carriers," as applied to tuberculosis, should be restricted to a very limited number of patients who are without signs and practically free from symptoms. There are such cases in all large clinics. Such a person will come in because urged to do so, having a little clearing of the throat in the morning, but no clinical signs or symptoms. These patients occasionally show tubercle bacilli in the throat clearings. I have seen two or three yearly whom I should say would come under this head, where repeated chest examinations, not with x-ray, but with ordinary clinical examination, showed nothing in the chest. We should limit the term "carriers" to this type of infection.

The question then arises as to how dangerous patients clinically discharging tubercle bacilli are to the general public. Some time ago I took a series of fifteen cases, collected their sputum, isolated the organism, grew it out on media, and injected the living organisms into a series of guinea pigs to see what I could find out as to the variation in the virulence of the organisms. Some of these cases were in the second, some in the third stage; some had run but one year, some five or six years, but were still throwing off bacilli. In all these fifteen cases there was a variation in the length of time the disease had run. The more chronic the disease, the longer the animal lived, but in every instance the animal succumbed. This may give us some idea as to whether we should allow these people to be at large in the community. At the Mattapan Hospital today there are a number of men who have been there from one to five years. I do not believe that the person who is throwing off tubercle bacilli, and who is ignorant and careless, should be allowed at large in the community. I think the place for that man is in a hospital, even if it is necessary to keep him there under compulsion. I do not mean to include in that group the man who is well trained and educated. We must expect that he would naturally consider other people; but sometimes, even among the most carefully trained and educated, there is often lack of care.

If this is true among the trained, what can we expect from the ignorant and indifferent consumptive? Such cases should be isolated as long as they are a menace. In this way alone can we hope finally to check this disease.

WHAT CONSTITUTES CLINICAL TUBERCULOSIS IN ADULTS?

BY GEORGE L. SCHADT, M.D., SPRINGFIELD, MASS.

THE correct answer to the question as asked in the title of my paper this afternoon would be as welcome probably as would the correct answer to the question of a decade ago, "How old is Ann," and I, for one, feel that it would be just as welcome. Any discussion that has to do with the necessary factors, such as history, constitutional symptoms, physical signs, considered requisite for a correct diagnosis of clinical tuberculosis in the adult, is of necessity more or less a compilation of the ideas and experiences of other men working along similar lines, and to some extent the conclusions reached from the observation and study of many cases by the individual.

I trust that I shall not appear dogmatic in my remarks and the conclusions reached, but it would seem that dogmatism on the part of many of us is more or less necessary in arriving at general conclusions as to the values to be placed upon the different factors necessary to the making of a positive diagnosis of active pulmonary tuberculosis in the adult. If it were possible for us to make definite answer to such an important question, one so far-reaching in its effects and results, economically and otherwise, we would be far along toward ultimate victory in the campaign against tuberculosis; it would make the work, of not only the general practitioner, but of the expert as well, much easier. This question, however, cannot be answered by the setting aside of one or two constitutional symptoms and one or two physical signs, and saying that these together in every case make up the symptom-complex necessary for the diagnosis of clinical tuberculosis. Smith[1] well says: "There is no easily applied test for clinical tuberculosis. A negative physical examination is not conclusive, and a prolonged observation of the general health is often necessary." Pottenger[2] says: "That in studying the clinical history and the symptom-complex of pulmonary tuberculosis, everyone must have been more or less impressed with the indefiniteness of the symptoms and signs connected with this disease. There are some 25 or 30 different symptoms which accompany early tuberculosis, and even more in advanced tuberculosis; and, if we think of each symptom as an individual entity, there is no end of confusion." He also says: "It is characteristic of the symptoms of early tuberculosis that they are inconstant. We do not find any single symptom or any particular group of symptoms present under all circumstances."

We can no more say that a slightly increased pulse rate with a little temperature elevation means active tuberculosis than can the general practitioner say that a dicrotic pulse and a positive Widal in every case mean typhoid fever. For in either case we may have other conditions simulating tuberculosis on the one hand, and typhoid on the other, from which it is very difficult to separate the true from the false.

Personally, it does not seem to me that consideration of this question limits us to the consideration of what constitutes the diagnosis of so-called incipient tuberculosis only, but that rather, we should take a broader view of the question and consider this afternoon what we need in each individual case to make a positive diagnosis in the patient presenting with symptoms simulating either early tuberculosis, moderately advanced tuberculosis or far advanced tuberculosis. Evans[3] some time ago called attention to the fallacy of using the term "incipient tuberculosis" in describing a condition, the pathology of which was sufficiently advanced to give rise to demonstrable physical signs, and that true incipiency in lung tuberculosis is not clinically demonstrable. I believe that as many errors in diagnosis are made in those adults seeking us for advice with symptoms which they or their medical adviser construe to mean tuberculosis not alone in the early stages, but in the later stages, and I feel that many of you will agree with me when I say that, looking back, we can recall that in many a patient who presenting with fever, increased pulse, cough, and perhaps a râle, it was with the greatest difficulty we were able to arrive at any definite conclusions, if we arrived at any. I feel no hesitancy in saying that, for my part, the diagnosis in these people has caused me as much concern as any with whom I have been confronted.

It would seem that we have clouded the diagnostic field in the last few years by focusing our attention simply upon the question, is or is not this a case of beginning pulmonary tuberculosis, and losing sight of the many that come asking the question, have I or have I not active clinical tuberculosis, and bringing definite symptoms of some pathological condition existing in the pulmonary tract, not necessarily tubercular, but demanding just as sincerely a diagnosis, and in so demanding calling upon the highest degree of medical equipment and scientific accuracy for making the correct one. I cannot but feel that it is here that most errors in diagnosis are made, notwithstanding the widespread feeling that seems to prevail among the medical profession, that it is a simple matter to make a diagnosis of tuberculosis in the moderately advanced or far-advanced stages.

Minor[4] of Asheville, in discussing a paper at the recent National Tuberculosis Association Meeting in Washington, said, that in his opinion, it was the inadequacy of ability to listen and to interpret signs and symptoms in making an early diagnosis of tuberculosis that accounted for so many errors. He also emphasized the fact that most general men look for loud moist râles before making a diagnosis of incipient pulmonary tuberculosis, but that it was his opinion that when these were heard the case was advanced beyond the incipient stage. I would again emphasize it as my opinion that it is the inadequacy of ability to listen and to interpret signs in the making of a diagnosis in the advanced stages also that accounts for the presence in the many sanatoria of the non-tuberculous cases and those coming to autopsy.

During the last year[5] 1629 patients were admitted to the four sanatoria of this State; of this number 12 were non-tubercular and 16 not determined or classified. I do not quite understand the meaning of the term "not determined," unless it means that these cases were sent in without diagnosis or had not been examined before the report was made up. However, we have here 28 patients out of 1629 who either did not have tuberculosis or in whom it was questionable—a matter of 1.6%. Ash,[6] in a careful study of the pathology of the mistaken diagnoses at the Boston Consumptives' Hospital analyzed 198 necropsies performed in that institution since its foundation; 23, or 11.5%, proved to be non-tuberculous, in so far, at least, that there was no active lesion demonstrable. The anatomic diagnoses were:

	No.	Percentage of Non-Tuberculous.	Percentage of Total.
Pneumonic sequelae ...	8	34.5	4
Chronic cardiorenal	5	30.5	3.5
Aneurysm of aorta	2		
Malignancy	5	21.5	2.5
Septicemia	2		
Actinomycosis	1	13.5	1.5
		100	11.5

He also collected 353 necropsies performed at other institutions, and of this number 38, or 10.8%, proved to be non-tuberculous, showing, as he says, that the experience is not a local one, confined only to this institution. Anatomic diagnoses of these cases were:

	No.	Percentage of Non-Tuberculous. Necropsies.	Percentage of Total. Necropsies.
Pneumonic sequelae	3	8.0	0.8
Cardiorenal	22	58.5	6.2
Aortic aneurysm	4	10.5	1.1
Malignancy	2	5.0	0.6
Septicemia	2	5.0	0.6
Syphilis	4	10.5	1.1
Pellagra	1	2.5	0.3

In his conclusions Ash says, "It may seem radical to be sounding a warning against diagnosing tuberculosis, but it must be remembered that we are dealing here with types of cases that are confused with those in the advanced stages of tuberculosis, in which it is very unlikely to be overlooked; and that we are not considering the early stages of the disease, in which the tendency is to err in the other direction, that is, fail to recognize the presence of the infection." Hawes[7] mentions many conditions that were wrongfully considered to be tuberculosis, among them chronic influenza, hypernephroma of the lungs, chronic empyema, syphilis and abscess of the lung. Luetscher,[8] in an interesting study of respiratory infections, asserts that 62.5% of all non-tuberculous infections below the larynx are due to pneumococcus and 28.5% to the influenza bacillus, and that these organisms together cause 91% of the infections of the bronchi and lungs, 75% of the infections of the larynx, and 31% of the infections of the nose, throat and sinuses.

From a consideration of these figures, it would seem that there are certainly enough errors in the diagnosis, not only of the early case, but of the old case as well, to cause us to pause and carefully to consider and correlate the physical signs and constitutional symptoms of each individual case and not make a diagnosis upon one or two symptoms that may indicate that the individual is suffering from some vague infection in the pulmonary tract, and not, of necessity, infection with the tubercle bacillus. Bluemel,[9] among a large number of soldiers sent to him with the diagnosis of pulmonary tuberculosis, found that 80% did not have the disease. The symptoms and signs which had led others to the diagnosis were cough, pain in the chest, expectoration, and slight evidence of the impairment of resonance over the right apex, with some changes in the breath sounds. When we stop to consider the enormous number of individuals being sent yearly to the different State sanatoria, not only in Massachusetts, but in every State in the Union, and when we consider the numbers sent who are not tubercular, it should cause us to speculate upon the adequacy of our individual ability to interpret the signs and symptoms of this infection and to endeavor to formulate in our own minds a symptom-complex or symptom-complexes that will permit us to say with more accuracy than we have in the past that this man is tubercular or that this man is not tubercular.

I would not wish you to feel from the foregoing remarks and from any I may make later that it is my desire to belittle the efforts of the general practitioner or expert in the diagnosis, but I do wish to emphasize the fact that we must use more care in correlating the evidence leading us to label anyone as tubercular. It is Fishberg's[10] opinion that from the social and economic standpoint, a diagnosis of tuberculosis is a serious affair and that we should not hurry in making it until we are sure of our ground. It is argued that tuberculosis, to be cured, must be taken hold of in time, and that there is comparatively little harm done if a few persons are inconvenienced, provided the vast majority of tuberculous persons are discovered in time. This would be important if true, but it is not. That all tuberculous patients could be cured if discovered in the incipiency of the disease is one of the numerous traditional errors which abound in practical medicine and the sooner we are rid of this error the better for the patients and for the physicians.

It is my firm conviction that as many, if not more, individuals are every year labeled with the diagnosis of pulmonary tuberculosis on just as insufficient grounds as are sent away from our offices with the diagnosis of non-tuberculosis after insufficient examination and consideration. I am certain that many will agree with this statement, when it is recalled how many lesions of the pulmonary tract may simulate in every detail pulmonary tuberculosis presenting varying symptoms from hemoptysis, rapid pulse, temperature, and cough to extreme emaciation and death. Agreeing with Fishberg,[10] it has been a question in my own mind whether the feeling so prevalent is correct, that it is better to be mistaken in making a positive diagnosis on one innocent person, than to err in not making a diagnosis on a tubercular. More and more I am convinced that this feeling is not right and just, and that if we would but use more care in our examinations, with a better understanding of the symptomatology and physical signs, availing ourselves of the scientific methods of diagnosis at our disposal, we would be able to say more definitely in practically every case whether the disease exists clinically and is active.

I trust that I shall not be misunderstood in my remarks and have you think that I desire to belittle the work and endeavors of those who strive for the earliest possible diagnosis of this disease, for I appreciate as much as any one the extreme value of early diagnosis. It is rather my belief, however, that in seeking the early diagnosis and the late diagnosis also, that we should endeavor by all means at our hands to make it correct as well, remembering that there are other pathological entities, which may resemble tuberculosis in every respect, within the thorax.

I wish next to consider the question of the values that shall be given the different signs and symptoms due to pulmonary infection which we consider necessary in enabling us to say definitely that active tuberculosis is or is not existent in the lung tissue. In this discussion, we run the scale from the time of Hippocrates and Galen, who wrote so much on the so-called "habitus phthisicus," and who placed so much dependence upon the presence of this so-called phthisical chest in the making of a diagnosis, to the so-called modern practitioner, who still insists and demands a positive sputum with the presence of bacilli before he makes a diagnosis of beginning tuberculosis. We are all of us more or less prone, I believe, to have ideas as to the values of the different signs and symptoms required before we individually will make a diagnosis. I think that in many clinics, that in many private offices as well, a patient presenting for examination and diagnosis is too often approached by the examiner with his mind prejudiced by certain symptoms, such as cough, night sweats, etc., more or less made up as to what he should and what he must find to tally with them in the examination of the chest, considering every patient as tubercular until proven otherwise.

As one is confronted with the numerous articles bearing upon the subject of the diagnosis of tuberculosis, it is truly amazing to note the differences apparently existing in the minds of the writers as to the requisite signs and symptoms which they deem necessary and demand before making the diagnosis. Some years ago, it was whispered abroad that a well-known phthisiologist claimed that it was possible and that he would himself make a diagnosis of clinical tuberculosis on a rapid pulse, from 90 to 100, maintained during rest, and in the absence of any other constitutional symptom or physical sign. From this tyro, and the general practitioners and experts who insist—and perhaps they are right—that every case of hemoptysis is tubercular in origin, to the general practitioner who still insists upon the absolute necessity of positive bacillary findings in the sputum before labelling the patient as tubercular, it is a long road. We have, also, those men among us who, overcome by the brilliancy of the radiogram, hypnotized by the brilliant diagnostic skill and verbal acumen of the roentgenologist will permit a diagnosis of active clinical tuberculosis to be made on the radiogram alone, in the absolute absence of any signs or symptoms, permitting the patient to be sent away on these slender grounds.

It has been a source of much interesting study during the past few years to observe the varying symptom-complexes which different competent men of my acquaintance have insisted be present before they would make a diagnosis, and in many cases making a wrong diagnosis because of the presence of some symptom or sign, or both, considered by them as always belonging to pulmonary tuberculosis and to no other condition. The number of men who still insist on cough, dulness, râles, and in some cases positive sputum before making a definite answer, is astonishing. The same may be said of the number who, in the presence of cough, dulness, râles and other signs of an apparent moderately advanced or far advanced case of tuberculosis, but without any symptoms whatever, invariably make an immediate diagnosis of tuberculosis, without proper or careful analysis of the condition in all its phases.

I was much interested while in Washington last month, in ascertaining from some of the men present, the signs and symptoms, and the values they gave them, upon which they would make a clinical diagnosis of tuberculosis in the adults. It was very interesting to see the way in which different signs and symptoms were valued. For instance, how much dependence one man placed upon some factors, such as temperature and pulse, and again how little another man placed upon the same. I wish only to cite the opinions as given me by two or three men present. One gentleman of long sanatorium experience said that he insisted upon the presence of a localized râle or râles in the lung at or near the apex before making a diagnosis of clinical tuberculosis in the adult, notwithstanding the constitutional symptoms presented. Another gentleman placed a great deal of stress upon the history, particularly of contagion, and upon the constitutional symptoms demanding an afternoon temperature of 99.5 and a pulse between 90 and 100. He did not, however, insist upon the presence of the râle. The third man also placed much dependence upon the history, and said that in his opinion dyspnea was always one of the early symptoms of clinical tuberculosis. That dyspnea with an increased pulse rate and afternoon temperature with cough were the four symptoms upon which he placed the greatest reliance.

From the consideration of only these three differing opinions, I believe it can be realized how difficult it is to arrive at a conclusion as to the ideal symptom-complex in the making of our diagnosis. It seems that the value of the different constitutional symptoms and signs following infection produced by the tubercle must always remain more or less individual, and that there must always be a question of personal equation and the varying abilities of the men, as Minor, quoted above, has said, in interpreting signs and symptoms. I do not believe anyone, no matter how experienced or expert, can say dogmatically that this or that symptom-complex means tuberculosis in every given case, but that it is rather a judging of the values of the symptoms and signs, individually and collectively present in each patient, that will aid us.

I feel that between the varying demands here represented, we have, on the one hand, those who make their diagnosis on a foundation too slight and, on the other hand, those that demand too much; and in my opinion one is as bad as the other. Both are irrational in their methods of diagnosis and show the need for more serious study in each individual case and better correlation of the history, physical signs, and constitutional symptoms. It would seem that for some time the diagnosis of clinical pulmonary tuberculosis has been regarded as a very easy problem and that the responsibility resting upon the physician for labelling a man or woman as a tubercular is *nil* and not to be considered of any importance. I do not agree with this attitude and feel that we should withhold our diagnoses until we are convinced in our own minds that tuberculosis is present.

As intimated before in this paper, I believe it is impossible for any one man to say that any one particular group of symptoms or signs would always mean tuberculosis in the adult. From my experience, I am convinced that a patient may present with varying symptom-complexes of all sorts and types of symptoms and signs and yet upon many of them we will be unable to make our diagnosis. I feel certain that many will agree with me in this contention. It is not my purpose in this paper, in considering the signs and symptoms necessary for a diagnosis of clinical tuberculosis in the adult, to go into the anatomical explanation and the pathological conditions that make for each sign and symptom. I do not feel that I should take your time in doing so, nor do I feel it necessary to go into the consideration of every possible sign and symptom which a person with some pathological condition existing in the pulmonary tissue and adnexa simulating tuberculosis may have, since many of them are of very little value at best. It is my purpose rather to take up some of the signs and symptoms which in conjunction with other signs and symptoms convey to our mentality definite conclusions.

Heise[11] of Saranac Lake, in discussing a paper on the early diagnosis of pulmonary tuberculosis at the recent National Association Meeting in Washington, brought out a number of very interesting points which I think would be of interest here and would perhaps make clear in the minds of many why two or three persons of the same apparent amount of infection react so differently. He emphasized the fact that we must always bear in mind that there are two types or classes of tubercular infection of the pulmonary tract, one the peribronchial type, and the other the parenchymatous type. He again emphasized the fact that in both, the constitutional symptoms of fever, rapid pulse, cough, etc., are present in equal degree, and also that the physical signs were the same in many of the cases. The important point to my mind that he brought out, however, was that in only 3% of the peribronchial type of infection were tubercle bacilli found in the sputum, while 47% of the parenchymatous type of infection showed them present, also that the percentage of relapses in the peribronchial were only about one-half, or 50%, of the relapses occurring in the parenchymatous type. A reconsideration of the cases that many of us have seen with these remarks in mind, will, I am sure, clear up the reasons why we never found the tubercle bacilli in the sputum in some and why relapses were so frequent in others.

Pottenger[12] in a very interesting article of recent date has suggested that the symptoms of early clinical tuberculosis be classified according to their etiology, grouping them into three groups: those caused by the toxins, those of reflex origin, and those due to the tuberculous process *per se.* As he remarks, some have a double etiology and will be found in more than one group as will be seen by referring to the table below:

TUBERCLE TOXINS.	REFLEX ACTION.	TUBERCULOUS INVOLVEMENT PER SE.
Malaise. Feeling of being run down. Lack of endurance. Nervous instability. Indigestion or loss of weight. Night sweats. Temperature.	Hoarseness. Indigestion or loss of weight. Chest pains, particularly aching of the shoulders and over the apices and upper portion of lung. Tickling in the larynx. Cough. Increased pulse rate. Flushing of face.	Frequent and protracted colds. Spitting of blood. Sputum. Pleurisy. Temperature.

A study of these three groups will reveal that we have here every possible symptom that might be expected to occur following pulmonary infection with the tubercle bacilli or other infecting organisms, and also other infecting and pathological conditions outside the pulmonary tract. I think it well to bear in mind that any one of these symptoms or many of them may be caused by conditions outside the thorax. As Hawes[13] well says, "Failure to bear in mind that it is perfectly possible for a person to lose weight and strength, become weak and even develop a cough and run a fever without this being due to tuberculosis, is to be kept in mind. In these days, when the professional and lay mind is constantly being prodded in regard to tuberculosis and its cure and prevention, it often happens that the young and enthusiastic medical student or physician becomes imbued with the idea that tuberculosis is the cause of all our chronic coughs, colds, and run-down conditions. To a large extent this is undoubtedly true, but the fact that there are many other causes of such conditions must not be forgotten."

I am certain that none of us would care to take the responsibility of making a definite diagnosis, breaking up a home and sending a patient away on one or two of these symptoms alone, but would rather require a number of them and other factors before making up our minds. It is not possible, in my opinion, to classify the physical signs due to invasion of the lung tissue in a manner such as this, in view of the fact that so many pathological conditions may cause signs exactly similar to those produced by the tubercle bacilli from the râle, consolidation, transmitted voice to bronchophony, pectoriloquy and signs of cavitation.

I have become more and more convinced in the last few years of the value of the history in the making of a diagnosis. I do not contend, as do some, that it is possible to make a definite diagnosis on the history of tubercular exposure, not alone in the family but from a room mate, shop mate, a school companion or what not, but it is certainly of the greatest possible aid to us. Hawes[13] puts the matter in a nutshell when he says, "There is probably no disease whose onset is so insidious as tuberculosis, unless it be some forms of gastric cancer. There certainly is no condition in which a detailed and painstaking history is of more real value in diagnosis, as well as in future treatment." Many other competent observers have in recent articles repeatedly emphasized the value that consideration of the history gives in the making of a diagnosis. It would seem, however, that many general practitioners ignore the question of the history completely, contenting themselves with a little percussion and a little auscultation of the chest, basing their opinion upon those factors alone. I do not think the value of the history in making a diagnosis, not only in the so-called incipient or early stage of tuberculosis, but also in the moderately advanced stages can be emphasized too much, or brought to our attention too frequently.

Let us now consider the constitutional signs and their values. I feel that Pottenger has, indeed, made it very easy for us in his explanation of the signs from the etiological standpoint, as just mentioned. He says that signs due to the toxin itself are not indicative always of an infection due to the tubercle bacilli, but may be caused by any infection that depletes the organism. Surely malaise and the feeling of being run-down are always prevalent. Instability can never be considered as a symptom in any way of infection with but one bacillus, nor can night sweats nor temperature. Any and all of these symptoms may be experienced by persons suffering with almost any low-grade infection. Without a definite history of tubercular contagion, I feel that most of these symptoms are of little value; with a history, of the greatest value.

Indigestion or Loss of Weight. How frequently we see patients who come complaining of a little anorexia, a little indigestion or a little loss in weight. There is certainly much misunderstanding about the normal weight in a given individual, and, as a matter of fact, I think that the average man knows as little about his normal weight at any time as he does about anything. This symptom itself is of little value unless accompanied by several other symptoms.

Temperature Curve. In the early diagnosis of tuberculosis, the temperature curve is of great value, and particularly so if other suspicious symptoms are present along with it. In the consideration of this symptom, a few remarks regarding the necessary care and exactness required do not seem out of place. It would seem that too many men are content to take a morning and an evening temperature, specifying neither time at which it shall be taken nor how long the thermometer shall be kept in the mouth. It is my opinion that the ordinary temperature chart kept in this way is valueless. It teaches us nothing. The ideal temperature chart in the suspicious case should be taken every two hours, or if this is not possible, the first temperature should be taken on awakening, again at 12 M., again in the afternoon about 4 or 5, and again about 8 P.M. The temperature chart kept for two or three days is of little value, but should rather be kept at least a week as outlined. It perhaps seems unnecessary to remark that the patient should not take the temperature after having had hot or cold drinks in the mouth; but how often we see just this thing done, and naturally the chart loses its effectiveness.

Night Sweats. Night sweats may be due to the action of any particular toxin on the vasomotor system, causing lack of tone and undue relaxation,—a symptom in my opinion the value of which is somewhat exaggerated, and one upon which I do not think it possible to make a definite diagnosis of tuberculosis alone.

Let us next consider the symptoms due to the reflex action of the tubercle toxin. These, as a consideration of the chart will show, vary from hoarseness, chest pains, tickling in the larynx, cough, etc.

Hoarseness and Chest Pains. Hoarseness is often found as one symptom of early tuberculosis. We all appreciate how common it is in the advanced stages, when necrosis is present and cavity formation has taken place. I feel that we should pay more attention to the aching over the shoulders and over the apices of the upper portion of the lungs and the chest pains, for it is remarkable the number of patients who complain of these pains and aches early in the infection.

Cough. The cough, which is probably the first symptom appreciated by the patient, above all others, and the one which brings him to his family physician or the specialist, is not necessarily due to the tuberculosis of the lung, and we should not prejudice our minds with that fact. That it is difficult for the laity with very little elementary knowledge of medicine, not to be impressed with this symptom, is not surprising, and I think it is the one symptom that always means pulmonary tuberculosis to them. This condition should not obtain among trained medical men, but that it does we must admit, and that there are medical men who still are impressed greatly by this symptom is a fact. I do not exaggerate when I say that the word cough and the symptom itself convey to the minds of us but one pathological entity—tuberculosis. It is regrettable and I believe the reason for more errors in diagnosis than any other one symptom.

Increased Pulse Rate. This particular symptom, and again I would emphasize that it is not a pathognomonic symptom of tuberculosis infection in any sense, since the toxin action of any infecting organism causes an increase in the pulse rate, and one of the symptoms we expect and look for. As yet, I am not prepared to accept the pulse, in the absence of other symptoms or signs, as an indication of tubercular infection.

These reflex symptoms are not in any way distinctive, yet they are much more so than symptoms due to toxins themselves, and if accompanied with other symptoms, should arouse suspicion regarding possible infection of the pulmonary tract with tubercle bacilli.

Pottenger,[2] speaking of these groups, says that there is nothing distinctive of tuberculosis in that group which is due to toxemia, and that he was further impressed with the fact that the second group, those of reflex origin, all point to organs other than the lung, but that they belong to organs which are supplied by the vagus and sympathetic nervous systems, both of which supply the lung.

Symptoms Due to Tuberculous Process Itself per se. That there are a few symptoms due to the tuberculous process itself is self-evident, and that they are probably the most important we have in early clinical tuberculosis is also evident, but we must not forget that they may at any time, and in any place, mislead us. The unfortunate part about these most important symptoms is the fact that as a general rule they appear later than do some of those due to the tubercular toxin and the reflex action of the toxin. They presuppose, either an involvement of some duration, or one of an area of considerable extent. In fact, when we make a diagnosis of clinical tuberculosis, it has, as a rule, existed for some time, and there is always a considerable area involved. These symptoms should be rarely mistaken for any other disease or condition. I wish, again, at the expense of repeating myself, to recall to your minds Evans' [3] remarks upon the diagnosis of so-called incipient tuberculosis. It is in this group of symptoms, due to the tuberculous involvement *per se,* that we find the symptoms that are more definite and that help us more in reaching conclusions as to the process present in the diseased pulmonary tissue.

Frequent and Protracted Colds. A history, and it is a common one, when a patient comes saying that it has been a winter or a spring of frequent and protracted colds, to get over one cold but to get another, means much toward the diagnosis, taken in conjunction with other symptoms or signs that may be present. I have been impressed during the last year with the number of patients who have come with this history, and presented, among other symptoms, a definite temperature curve, increased pulse rate, a little loss of weight, and perhaps night sweats. I am afraid that in many cases these attacks are passed over with the catch-all diagnosis of la grippe, but inquiry will usually show that these colds are not frequent attacks of grippe, but that they often start as a bronchitis and at other times as head colds, ending as bronchitis. A history of frequent and protracted colds with temperature elevation should always arouse suspicion and should call for most careful investigation, and physical examination.

Hemoptysis. Hemoptysis, or spitting of blood, with the possible exception of cough, is, perhaps, to the mind of the average medical practitioner, the most important and diagnostic sign that exists in tuberculosis. It is regarded by many that hemoptysis always means tuberculosis until proven otherwise.

Pottenger[12] says, "While there are other causes for this symptom, yet the fact that the patient raises blood is presumptive evidence that tuberculosis is present, and the evidence is conclusive in most cases when the blood is bright and mixed with sputum." Riviere[14] quotes Barnes as having found hemoptysis the initial symptom in 15% of cases, Bonney among 546 cases (20%), and Bartlett in only 6% among 400 cases. He further says, "The value of a well-marked hemoptysis is so great as to make this symptom, when well authenticated and other causes can be excluded, well nigh pathognomonic of tubercle. It is, then, of the utmost importance that with a free hemoptysis, other causes being excluded, phthisis should be presumed." Lord,[15] in a recent and most excellent paper, says that it is his belief that hemoptysis out of a clear sky is always tubercular in origin, whether symptoms and signs are present or not. In 307 cases of hemoptysis from the records of the Massachusetts General Hospital, all of them presumably tubercular, 30 came out of a clear sky, with no preceding sign or symptom, no pain, no dyspnea, no loss in weight, and no râles. Twenty of these 30 were found to be clinical cases of pulmonary tuberculosis; 10 came to autopsy, and all but one, or 90%, proved to be tubercular. I would, however, call your attention to this one case that did not prove to be tubercular in this series, for it represents 10%, and I think it is well for us to realize that there are perhaps other such cases as this one, in which any of us may at any time err in the matter of diagnosis.

I am very frank to state that, for one, I do not believe that every case of hemoptysis, with or without preceding signs or symptoms, is of necessity tubercular in origin, but that rather we should make every effort to make the diagnosis regardless of this symptom, and not let it cloud the issue, as it generally does. It would perhaps be well to mention the conditions which may cause hemoptysis out of a clear sky, as well as tuberculosis, and there are many as Lord[15] gives them: 1, syphilis; 2, nontubercular suppurations, abscess or gangrene; 3, echinococcus; 4, pneumonia; 5, pulmonary infarction; 6, aneurysm; 7, new growth. Lawrason Brown,[16] in discussing Lord's paper made the statement that it was his opinion that every case of pulmonary hemorrhage should be considered as tubercular in origin until proved otherwise. There has been much discussion recently as to whether or not pulmonary hemorrhage may follow high blood pressure; it is believed by some that it is possible. I have never seen a case of hemoptysis due to this cause.

Pleurisy. Pleurisy with effusion has for many years been considered as always tubercular in origin by many, and of late the feeling seems to be growing that dry pleurisy should also be classed as tubercular until proved otherwise. I agree with this feeling, for every case of dry pleurisy that I have seen in the last five or six years has proven later to be tubercular.

Sputum. The question whether or not a person suffering from pulmonary tuberculosis should raise sputum or should not has been a source of controversy for many years, and there are those who still contend that it is necessary for sputum to be raised during the process of early active tuberculosis. The question of whether positive bacillary findings in the sputum are absolutely necessary before making a positive clinical diagnosis would seem to be too old for discussion, but that there are still many men who demand and insist upon tubercle bacilli being demonstrated before arriving at definite conclusions, though regrettable, is a fact. I believe that it is just as possible to make a definite diagnosis with a negative sputum as it is with a positive sputum, and a study of the records of the many State sanatoria would bear me out when I say that there are many patients in them, who do not show constant sputum findings, and there are many who, throughout the course of the disease, never give a positive sputum. In explanation of many of these cases, I would again bring to your attention Heise's[11] remarks regarding the two types of tuberculosis,—peribronchial and parenchymatous. In the former, tubercle bacilli were found in only 3%; in the latter, 47%.

Temperature. The last symptom considered in this third group has been described as under symptoms due to the tubercle toxin.

When any one of the first three symptoms found in this group, particularly if accompanied by one or more symptoms of this or either of the other groups, especially with elevation of the temperature curve occurs, we have strong presumptive evidence of clinical tuberculosis, whether any further evidence can be found or not, and with the manifestation of a positive tubercular reaction, we feel that we are absolutely justified in making a diagnosis of active tuberculosis.

Tuberculin. A few words as to the use of tuberculin in the diagnosis of pulmonary tuberculosis. I am not quite in agreement with Lord,[22] who, speaking of the use of tuberculin subcutaneously, says, "I have been loath to use this test except as a last resort in diagnosis." Personally, I believe that tuberculin should be used to a wider extent in helping us to arrive at our diagnosis.

I believe, however, that it should always be used by one skilled in its use or under his personal direction, and not by the general practitioner, who at best understands its action so imperfectly. It would seem that needless chances are taken in administering large initial doses. An initial dose of from 1/10 to 1/2 milligram seems sufficient, with a gradual increase to 10 milligrams, increasing the dose every two or three days with the patient at absolute rest and taking a three-hour temperature chart.

Given certain symptoms in either of the three groups as mentioned by Pottenger,[12] with indefinite physical signs or none at all, I think that tuberculin injection is justified in many cases. If a positive result is obtained, its value depends upon the size of the dose to which the tissues responded. The smaller the dose required for temperature elevation, the greater evidence in favor of active disease.

Rivière,[14] speaking of tuberculin, says, "For each tuberculin test is compounded of many elements, some of which are of value, while others may be comparatively useless." Of the von Pirquet reaction he says, "No one, to take a concrete example, can in these days rely upon a positive von Pirquet reaction as evidence of active tuberculosis in the adult, and retain our respect for his intelligence; the vast mountain of fact is against him." I agree heartily with this characterization of the above, for from my own personal experience, I have found it of no value in adults, but of much in infancy.

X-Ray. The value of the x-ray findings in the study of lesions of the pulmonary tract is a source of much controversy, and will always remain so. On the one hand, are those who maintain that it is possible to make a diagnosis of active pulmonary tuberculosis in the so-called incipient stage by means of the x-ray, in the absolute absence of any signs or symptoms; on the other hand are those who maintain that the value of the x-ray in the diagnosis of tuberculosis is negligible, and it is only as corroborative evidence that it is worthy of consideration. Between these two differing views, there are, of course, many men who lean toward the one and toward the other.

Baetjer,[17] in a very sane paper on the "Early Diagnosis of Pulmonary Disease by the X-ray," read at the annual meeting of the National Association, said, "We cannot as yet make a diagnosis between active and inactive tuberculosis, and, in my opinion, it is not advisable to send a patient away solely on the x-ray diagnosis." It was also his opinion that the radiogram could not make the diagnosis of early tuberculosis in the absence of signs or symptoms.

Minor[18] of Asheville summed up the situation very well when he said that, "Only in conjunction with physical signs or constitutional symptoms is a positive x-ray plate of any value, and in my opinion it is never wise or advisable to stand upon the x-ray findings alone." My personal opinion is that the value of the x-ray rests upon its use in corroborating the positive clinical diagnosis made by the clinician, and that it should be used in this way only.

This paper would be incomplete without some mention of the physical signs produced by the invasion of the lung structure by the tubercle bacilli. It has been well said that this bacillus is ubiquitous in every way, and in no more striking a manner than in the diversity of pathological lesions produced within the chest cavity. It is not my intention, nor within the scope of this paper, to take up your time with a discussion of the pathological conditions following its entrance, with which you are all acquainted. Perhaps the most important physical signs are the râle, localized or diffuse, dulness over the chest wall, and signs of consolidation, with transmitted voice sounds. Lawrason Brown[19] says, "The importance of physical examination in the diagnosis of pulmonary tuberculosis has been over-emphasized, and symptoms are a better and a more accurate guide to activity than physical signs." He also says, "Symptoms without physical signs demand treatment, while physical signs without symptoms require careful watching." I do not think the case could have been better put, and I agree with his opinion in this matter.

It does not seem to me that it is possible for physical signs due to the tubercle bacilli to exist in the lungs without definite symptoms, but I emphatically believe that the reverse is possible. I am sure, in my own opinion at least, that the tubercle bacilli may invade the lung tissue, producing certain changes productive of symptoms, such as given by Pottenger[12] in the first or second group, but without demonstrable physical signs. I am always exceedingly suspicious of a chest which shows dulness with râles, but in which the patient has no symptoms, suspicious that it is something other than tuberculosis. I cannot agree with him who demands a râle or dulness before making the diagnosis in the presence of a definite history of contagion and some symptoms, but I will agree with anyone who, in the presence of moderate or marked dulness, râles, and transmitted voice, but with no history or constitutional symptoms, demands further evidence.

Bray[20] in a recent article expresses his belief that the râle is a very constant sign in incipient tuberculosis, and among the early physical signs the pulmonary râle is the one definite sign, the others merely represent deviations from the normal and, at most, are indefinite. He says that râles are latent in approximately 75% of early cases, and 30% of the moderately advanced; that localized apical râles are almost pathognomonic, other conditions that produce them being of rare occurrence. Glover[21] compares the various methods of diagnosis in tuberculosis of the lungs, particularly in regard to the distinction of active processes from inactive. Clinically, he attaches most weight to the presence or absence of râles, their absence, in his opinion, in repeated examinations excluding an active process. Rivière[14], on the other hand, says that it is a common error to believe that small medium râles heard at one or both apices suffice for the diagnosis of phthisis. In practice this sign is frequently found in catarrh of all varieties of causation, and unless the râles are consonating, or there is an accompanying loss of percussion resonance, there is no justification for any diagnosis beyond that of catarrh.

I agree entirely with Bray[20] in his statement as to the value of the localized apical râle in the diagnosis of this condition and it seems to me that his figures are conservative and accurate so far as my personal observations, in that râles are latent, go. Let us always remember that the simple expedient of employing cough during the examination will bring these râles out. In the words of the elder Janeway (Bray), "Invariably employ cough to elicit râle in tuberculosis." However, notwithstanding my belief in the value of the latent râle, I still think it is unnecessary to insist upon its presence in all early cases or moderately advanced ones any more than I insist upon the presence of bacilli in the sputum. From my own personal experience, I know that it is possible for moderate or whispered dulness to exist without a râle, either before or after cough, and, taken in conjunction with history and constitutional symptoms, to mean but one thing,—pulmonary tuberculosis.

Just a few words as to breath sounds and voice sounds. Rivière[14] covers the ground exactly, I think, when he says that, "Voice sounds, and especially whispered voice sounds, should be compared with that derived from the breath sounds. As a rule, these signs cling together."

From the above discussion of the symptoms and signs of tuberculosis studied from the etiological standpoint, we can see, I am sure, that, if properly analyzed, they give us much diagnostic evidence. Those of the third group, due to the tuberculous process *per se*, are, of course, the most valuable. A history of frequent and protracted colds or hemoptysis or pleurisy, wet or dry, with a temperature curve, should cause us to investigate, always with an open mind. Alone, I am firmly convinced that the symptoms in the first and second groups do not definitely mean tuberculosis. Associated with one or several of those of the third group, they are certainly worthy of the most serious and painstaking investigation. I confess that it is impossible for me to outline any sort of a symptom-complex or symptom-complexes to fit every suspected case; all I can say is that, in my opinion, it is ever necessary for each patient to be regarded as a distinct and separate one, analyzing the history, the constitutional symptoms and physical signs broadly and not permitting ourselves to be carried away by the presence of one or two signs or symptoms that may have been present in other patients in whom diagnosis of tuberculosis was proved. That there are certain symptoms that alone are of the greatest importance and value I freely admit. I cannot, however, bring myself to agree with the dictum that a patient be labelled for life as tubercular on such slender grounds as one symptom.

CONCLUSIONS.

In conclusion I should like rather briefly to review several of the points brought out in this paper and the convictions which I hold concerning them.

In the first place, I wish to emphasize again the belief that it is not only in the beginning cases of tuberculosis that we err in our diagnosis, but just as much in the diagnosis of the moderately advanced and advanced cases. I would urge you to consider the percentages of wrong diagnoses as cited by Ash[6] and the fact that during only the past year a matter of 1.6% of the individuals entering our State sanatoria were either non-tubercular or not diagnosed. Our responsibility is just as great in the diagnosis of the patient presenting with what seem to us all the necessary signs and symptoms for the diagnosis of advanced tuberculosis and I would urge upon you the necessity of approaching the examination in these cases with a mind as free and unprejudiced by the history of cough or hemoptysis as is possible, remembering that almost any pathological condition in the pulmonary tract may simulate tuberculosis in every respect.

Secondly, that Pottenger[12] in suggesting the consideration of the symptomatology from the etiological viewpoint has indeed made it easier to analyze the disease conditions.

Thirdly, that I feel from my own experience that Lawrason Brown,[19] and others more competent than I, are correct when they say that the importance of physical examination in the diagnosis of pulmonary tuberculosis has been overemphasized in that symptoms are a better and a more accurate guide to activity than physical signs; that symptoms without physical signs demand treatment; that physical signs without symptoms require only careful watching. With symptoms and a history but no physical signs, I feel that we can make a diagnosis in the large majority of cases; with physical signs but no symptoms, I feel that it is impossible.

Finally, it does not seem possible or probable that we can ever outline a symptom-complex of certain signs and certain symptoms and say that these signs and these symptoms in every suspicious case mean tuberculosis. It is rather my feeling that we must value each symptom and each sign for itself and in conjunction with other symptoms and other signs, for every case is a different one and has a different complex; and though deeming that certain outstanding symptoms, such as hemoptysis, cough, elevated temperature, increased pulse, and emaciation are suspicious of infection, I do not feel that we are qualified to say that this is a case of active clinical tuberculosis in an adult without proper and due consideration of the other factors present.

REFERENCES.

[1] Smith, F. C.: The Epidemiology of Tuberculosis, Jour. Amer. Med. Asso., January 8, 1916.

[2] Pottenger, Francis M.: Clinical Symptoms and Physical Signs in the Early Diagnosis of Pulmonary Tuberculosis: A Discussion from the Standpoint of Their Etiology and Their Relationship to Each Other. Illinois Med. Jour., January, 1916.

[3] Evans, George H.: California State Journal of Medicine, 1916, Vol. xiv, p. 20.

Quoted by John Ritter, Chicago, Jour. Am. Med. Asso.

[4] Minor, Charles L.: Discussion Twelfth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 11-12, 1916.

[5] Ninth Annual Report of the Trustees of the Massachusetts Hospitals for Consumptives.

[6] Ash, J. Earle: The Pathology of the Mistaken Diagnosis in a Hospital for Advanced Tuberculosis, Jour. Amer. Med. Asso., January 2, 1915.

[7] Hawes, John B., 2d: Errors in the Diagnosis of Pulmonary Tuberculosis, Boston Med. and Surg. Jour., October 28, 1915.

[8] Luetscher: A Bacteriological and Clinical Study of the Non-Tuberculous Infections of the Respiratory Tract, with Special Reference to Sputum Culture as a Means of Diagnosis, Archives of Internal Medicine, October, 1915.

[9] Bluemel: Medizinische Klinik, August 8, 1915.

Quoted by Fishberg: The Dangers of Hasty Diagnosis of Pulmonary Tuberculosis, Medical Record, January 22, 1916.

[10] Fishberg, Maurice: The Dangers of Hasty Diagnosis of Pulmonary Tuberculosis, Medical Record, January 22, 1916.

[11] Heise, Frederick H.: Discussion at Twelfth Annual Meeting of National Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 11-12, 1916.

[12] Pottenger, Francis M.: A Classification of the Symptoms of Early Pulmonary Tuberculosis Based on Their Etiology, The St. Paul Med. Jour., Vol. xviii, No. 1, 1915.

[13] Hawes, John B., 2d: Remarks on the Diagnosis and Treatment of Early Pulmonary Tuberculosis, Boston Med. and Surg. Jour., August 27, 1914.

[14] Rivière, Clive: The Early Diagnosis of Tubercle, Oxford Press.

[15] Lord, Frederick T.: Hemoptysis as a Symptom. Read at the Twelfth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 11-12, 1916. Boston Med. and Surg. Jour, July 27, 1916.

[16] Brown, Lawrason: Discussion of Dr. Lord's paper. *Ibid.*

[17] Baetjer, Frederick H.: The Roentgenological Aspect of the Early Diagnosis of Pulmonary Tuberculosis by X-Rays. *Ibid.*

[18] Minor, Charles L.: The Clinical Aspect of the Early Diagnosis of Pulmonary Tuberculosis by X-Rays. *Ibid.*

[19] Brown, Lawrason: Diagnostic Theses in Pulmonary Tuberculosis, Jour. Amer. Med. Asso., June 12, 1915.

[20] Bray, H. A.: The Latent Râle in the Diagnosis of Incipient Tuberculosis, Jour. Amer. Med. Asso., March 11, 1916.

[21] Glover: The Early Diagnosis of Pulmonary Tuberculosis, Quarterly Jour. of Med., Vol. viii, No. 32, July, 1915.

[22] Lord, Frederick T.: Certain Aspects of the Diagnosis of Pulmonary Tuberculosis: Discussion at Meeting of Section of Tuberculosis, Massachusetts Medical Society, June 8, 1915, Boston Med. and Surg. Jour., Oct. 28, 1915.

DISCUSSION.

Dr. Henry D. Chadwick, Westfield: I agree in the main with the statements in Dr. Schadt's paper, but I must take exception to some of his conclusions. I think he has very little basis for his conviction that as many patients are given an erroneous diagnosis of tuberculosis as there are positive cases that are wrongly told that they are free from that disease. I do not think that the time has come that we can justly criticize physicians for their errors in that direction and do not see that he has produced sufficient evidence to support his contention.

The State sanatoria last year admitted 1629 patients, whom the physicians of the state had diagnosed as having pulmonary tuberculosis. Out of that number 12 were found, after prolonged observation and tests, to be non-tuberculous. That is only about .74% of error. Of the 2000 cases admitted to Westfield since 1910, 23 have been found non-tuberculous, or about 1%.

In what disease with which internal medicine has to deal can a better showing be made? To my mind that is a splendid record and the physicians of the state are to be commended for their accurate diagnosis of a disease which presents so many difficulties.

In connection with the 11½% of non-tuberculous cases found at autopsy by Dr. Ashe of Mattapan, I think the following quotation from his paper should also be taken into consideration. "It is not to be supposed that the same percentage of error extends to all cases that have been treated in the hospital. It would be lowered by those cases of undoubted tuberculosis that have been discharged otherwise than dead; and further, greater effort has been made to obtain permission for necropsy in those cases of special interest, among which have been a majority of the non-tuberculous. Furthermore, in eight of these cases tubercle bacilli have been found and the diagnosis had been made largely on this basis, in spite of any doubt that had previously existed as to the true nature of the case."

He states—and I agree with him—that when a diagnosis is doubtful, especially if the patient is in an institution, several sputum examinations should be made, and not put complete confidence in one positive finding. There are possible sources of error in labelling specimens and recording the findings, and also occasionally patients, to prevent discharge, will borrow specimens of sputum from a positive but generous neighbor.

Granting that a few patients are sent to a sanatorium under a mistaken diagnosis, the harm done, if any, is not to be compared to the fatal experience of too long delay while waiting for conditions to develop so far that the patient himself is able to decide that he has consumption. In doubtful cases I think patients should be sent to a sanatorium for diagnosis. These institutions should be used as clearing houses. Even if found negative, a patient's stay in such a hospital can do no harm and may be beneficial. If the diagnosis can be cleared up in this way great good results to the patient. Are not patients frequently sent to a general hospital under a wrong diagnosis? Of course accuracy in diagnosis is to be desired in all cases, but do not carry it to the point of putting the patient's life in jeopardy by delaying until all positive signs are obvious. There would be fewer abdominal operations, but many more deaths, if surgeons waited for conditions to develop until a diagnosis was sure. Symptoms and physical signs are to be considered together in making a diagnosis. Physical signs do not distinguish the healed or latent lesions from one that is active. Symptoms, on the other hand, indicate the activity of the process and are to be considered almost exclusively in prescribing treatment. It is not necessary to send a patient away for treatment even when he has extensive physical signs if he had no symptoms of active tuberculosis. This should always be borne in mind when consulted by an ex-sanatorium patient, as not infrequently they are returned to sanatoria unnecessarily because of physical signs, but present no evidence of activity. If symptoms are present and physical signs cannot be made out, watch the case closely and without much delay consult with a specialist in chest diseases, whose better trained ear may be able to find a lesion before it has increased in activity or extent.

Hemoptysis.—This has been the initial symptom in 5% of the 1000 cases admitted to Westfield. I regard it, when present, as the most reliable of all the many symptoms of active tuberculosis. Don't give such a patient a sense of false security by saying the blood probably came from the throat unless you can prove that it does by finding the bleeding point. There will be fewer errors in diagnosis in such cases if, after excluding pneumonia, a positive diagnosis of pulmonary tuberculosis is made. Our percentage of arrested cases among those whose initial symptom was hemoptysis was equal to those having other symptoms at the onset.

Personal history is of the utmost importance, but the family history is of much less value, and especially is this the case with adults. Our records show that of 194 children under 14 years, 67% had a positive family history; in 209 patients from 14 to 20 years, it was positive in 44%; 815 patients over 20 years of age show but 34% with positive family history; therefore, it would seem to help but little in the consideration of the indivdual case.

Diagnosis should not be made on one symptom, but don't wait for them all. Neither form your conclusions on one pathological, physical sign, but don't wait for too many to develop. Consider all the evidence, giving the greatest weight to symptoms, exclude other possible diseases as far as you can, and then it is best to consider the case one of tuberculosis, and suitable treatment should be at once begun.

Dr. E. O. Otis, Boston: Those of us who are doing more or less special work in tuberculosis here in Boston frequently see and examine one another's patients as they go from one to another, and, as well, those who have consulted one or more dispensaries or out-patient departments. Sometimes we agree with the diagnosis made by our brother physicians, or at the dispensary or hospital, and sometimes we disagree; which goes to show, it seems to me, that it is extremely difficult in at least a certain number of cases to make a definite diagnosis upon one examination. The only thing we can do is to keep the patient under observation until further evidence is obtained.

In teaching the subject of tuberculosis I have found that the tendency of the student is to place undue value upon slight physical signs, such as slight or doubtful dulness and slight modifications of the respiration. This is not infrequently the case with the practitioner. We need more than indefinite physical signs in order to make a definite diagnosis. We must have definite symptoms of an active disease. One must bear in mind the difference between clinical and anatomical tuberculosis. In the latter case, whatever the physical signs, if there are no symptoms and the patient is not ill, he requires no treatment; while in the former, if we have the characteristic symptoms and the patient is ill, whether we can detect definite physical signs or not, the case is one of clinical tuberculosis and should be treated as such.

With regard to hemoptysis. I believe we should regard this as almost a pathognomonic symptom with rare exceptions. It is true that one occasionally meets with cases of hemoptysis where there are no other symptoms or none subsequently develop.

I agree with Dr. Chadwick that more importance should be placed upon the personal history of the patient than upon the family history. In my experience I have found the former more valuable.

With regard to râles. As we all know there can be almost any amount of infiltration without evidence of moisture, indicated by râles. If, however, we find at an apex persistent fine râles it is one of the most, if not the most important of the physical signs we have, although it may not be the earliest sign. Here again, however, one ought not to make a diagnosis upon a single physical sign, even râles. We must have at the same time enough of the characteristic symptoms to complete the evidence in favor of tuberculosis —but with the râles and symptoms a positive diagnosis can generally be made. After all, there are not a few border line cases, which are not infrequently sent away, to the disarrangement of the family life, which, in my opinion, had better be kept under observation at home until more definite evidence is obtained. We have been insisting so persistently upon making an early diagnosis that the pendulum seems to have swung the other way and I have found with increasing frequency that the diagnosis of tuberculosis has been made and been reported upon what has seemed to me insufficient evidence.

Dr. George L. Schadt, Springfield: In regard to hemoptysis. I would not wish to be understood as saying that in my opinion hemoptysis is not a very important symptom in early tuberculosis. My feeling, however, is that we should not let hemoptysis or any one symptom prejudice our minds to such an extent that we are willing to label an individual as tuberculous. It has been my experience in the last two or three years to see a number of individuals who have had pulmonary hemorrhages, apparently coming out of a clear sky, with no other symptoms following—no lesions, no temperature, no pulse—and every one of them has apparently recovered from whatever condition caused their hemorrhage. I am willing to admit, it might have been tuberculosis, but my feeling is still that we are not justified in labelling a person tuberculous on that one symptom with absolutely nothing else.

I must disagree with Dr. Chadwick when he says that it is his opinion that every case of suspected tuberculosis should be sent to the sanatorium for diagnosis. I disagree very strongly there. I do not think that you can make a comparison between the sending of a patient suspected of having tuberculosis to a sanatorium for diagnosis and the person suspected of having appendicitis to a general hospital. We look at it from different standpoints—he from the sanatorium point of view, I from the viewpoint of the practicing physician who comes in contact with the individual and with his family, and with the circumstances that ensue. It is the practicing or family physician who sees the after-results or opprobrium that comes to a person with a history of having been at a State sanatorium for tuberculosis whether he had the disease or whether he had not. I do not wish to go into the economic question; but I think it is little realized by the specialist, particularly by the sanatorium man, how much a history of having been an inmate in a State sanatorium for tuberculosis means to the individual in after-life.

Dr. Chadwick mentions 2000 cases admitted to the Westfield Sanatorium since its opening. In 23 of these there was found to be no tuberculosis, a little over one per cent. I think this is too much. I believe that we should not err even to one per cent. in the diagnosis of tuberculosis. I believe that by the proper correlation of our symptoms and our signs and our histories, personal and family, with the use of tuberculin, we could in pretty nearly every case make a definite diagnosis.

Dr. Otis emphasizes one of the points that I tried to make when he said that in his teaching he had learned a good many things: one thing commonest, that students are apt to over-emphasize certain points. I would emphasize that they are also apt to and do carry these ideas into practice. That is over-emphasizing certain symptoms indicating the probable presence of tuberculous infection, but not necessarily tuberculous disease. I have seen these men come into practice, and with a history of cough or a history of hemoptysis they have seen an indication of tuberculosis and nothing but tuberculosis. If a patient presents himself in the office and complains that he has had a cough for two or three weeks, or that he has expectorated a little blood, he is looked upon with the idea that tuberculosis must be found in him and not with the idea of simply forgetting the signs of hemoptysis, forgetting the cough and looking at the case in an intelligent manner, endeavoring to make a diagnosis with these symptoms as an aid and not because of the mere presence of these symptoms and nothing else.

◆

Medical Progress.

ELEVENTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY*

By Robert B. Osgood, M.D., Robert Soutter, M.D., Hermann Bucholz, M.D., Harry C. Low, M.D., Murray S. Danforth, M.D., Boston.

TUBERCULOSIS.

Ely,[1] reviewing his results obtained in a series of experiments on eleven rabbits and six guinea pigs, concludes that "the lymphoid marrow of rabbit's bones is a good field for the growth of bovine tubercle bacilli, and that the lymphoid marrow of guinea pigs' bones is a good field for the growth of human tubercle bacilli."

These results would seem to cast doubt upon the correctness of Fraser's[2] dictum that red bone marrow is practically immune to tuberculosis.

Manning and Knott[3] have sought by means of the von Pirquet reaction to determine the percentage of children suffering from tuberculosis and living in known tuberculous families, contrasted with the percentage in children living under apparently favorable conditions. Of the first group (166), 50% gave a positive reaction. In the latter group only 22%. In the whole number (232), only 42% reacted to the test, which is a very much lower percentage than von Pirquet's figures, which were 93% in children of about the same age. The average percentage of positive reactions among fourteen observers who have studied large series of cases was 75%.

Wolcott[4] analyzes the results in 682 cases of Pott's disease in which an operation had been performed, the purpose of which operation was to ankylose the spine at the seat of the disease. On 642 cases either the bone graft, after the method of Albee, or the plastic bone operation, after the method of Hibbs, had been performed. In 198 cases, done by Albee himself, he has reported 92% as improved. In 158 cases done by Hibbs himself 90% were reported improved, and in 286 cases done by other surgeons there was improvement in 73%. In the whole series there were thirty deaths, or a mortality of about 5%. Three cases developed paraplegia after the operation, five cases developed abscess; there were nine cases of sepsis, and in seven there was necrosis of the graft. Tuberculous meningitis developed in seven and miliary tuberculosis in three. The conclusions of the author are: 1. The operation may be expected to abbreviate treatment and hasten ankylosis. 2. By hastening ankylosis the tendency to deformity is lessened. 3. The operations are best adapted for caries involving the cervico-dorsal, dorsal, and dorso-lumbar regions,—parts of the spine in which limited motion is of little consequence. It is less well adapted for caries involving the cervical and lumbar regions, parts in which limited motion is a detriment. 4. The general opinion of the majority of surgeons is that the operation should be considered only as one phase of the treatment for Pott's disease and that post-operative support should be continued until all signs of active disease have disappeared.

---

* This Report is based on a review of 220 articles selected from about 350 titles having to do with Orthopaedic Surgery, occurring in medical literature between January, 1916, and March, 1916. References are given only to such articles as have been selected for note and comment.

[Ed. Note.—With these conclusions the Editors find themselves in essential agreement. We are sorry that there has not been a more careful analysis of the relative value of the two operations in hands other than the originators of the two methods. Our own impression is that in the early cases with small kyphoses, the bone graft operation of Albee is likely to yield as good results as the plastic bone operation of Hibbs. It is an operation which requires less skill and its technic can be more easily acquired. It can be done more quickly and, especially if the motor saw is used, need induce little shock. If the kyphos is of considerable size, the bone graft operation is more difficult, and the cutting of a simple curved graft or the applying of a series of long, thin, bendable bone splints, consumes time and adds complexities. In spite of contention to the contrary, these grafts cannot in our experience be expected to lessen materially the size of the kyphos. The Hibbs plastic operation, on the other hand, does lessen the apparent size of the kyphos, and where complicated grafts would be necessary, can be done almost as quickly and, we believe, with as reasonable an expectation of ankylosis. In Dr. Hibbs' hands or in the hands of those who have taken the pains to develop a technic, there seems to be no more shock than in the bone graft operation. We attach great importance to the detail of the technic in order to obtain satisfactory results. We still feel doubtful concerning the wisdom of these operations under four to five years unless it is impossible to provide recumbency followed by ambulatory apparatus. We feel thus doubtful because the results of carefully carried-out conservative treatment are usually so good and because, with soft bones and rapid growth, we should feel that recumbent and protective treatment ought to be continued even after an ankylosing operation for a period approximately as long as that required in an ordinary case for healing by nature, aided by bloodless art. A 5% mortality is gratifyingly low, but not negligible.]

ARTHRITIS AND BURSITIS.

Hemophilic Joints.

DuPan[5] relates that a boy of fifteen was brought to the hospital on account of a very painful tumor of the ankle, which seemed to be a sarcoma on the point of ulcerating, except that sarcomata are not, as a rule, so painful. The tibia was not tender, and although there were local heat and fever, yet there was no involvement of glands, no lymphangitis or fluctuation. A small incision brought dark blood, but no pus, and the little cut bled continuously for three days, confirming the final assumption of hemophilia. Under calcium chlorid and diphtheria antitoxin the oozing of blood was finally arrested. His family showed the usual skipping of the second generation and the reappearance of the hemophilia in the sons of the daughters, three of the five sons being pronounced hemophiliacs. In treatment the main thing is to suspect the hemophilia instead of mistaking the joint trouble for acute articular rheumatism or a tuberculous process, as is too often done. Du Pan declares that this error in diagnosis has often proved fatal. He cites various cases in which puncture of the joint for supposed hydrarthrosis has caused bleeding to death. The blood accumulating in the joint causes sudden pain and swelling, and the limb is held as in acute rheumatism. The region feels hot and there may be fever, but the skin keeps its normal color. There are, as a rule, several successive attacks involving different joints, but mostly the knee or elbow, one at a time, with or without some slight local trauma preceding. The hemarthrosis may be enitrely absorbed, but it usually persists and irritates the joint, resulting in chronic arthritis. In the second phase this arthritis resembles in every respect a white swelling; there is thickening of the synovia, impotence of the limb, and wasting of the muscles. The pain is less in this stage, the swelling becomes more general, and the culs-de-sac are distended, but local heat does not increase. There is elastic fluctuation in the synovial culs-de-sac, as with a tuberculous process, and partial ankylosis develops. After the inflammation has subsided, insidious destruction may continue, and there is never an abscess or fistula, and never any enlargement of glands, as from malignant disease. There is danger of mistaking hematomata in muscles for cold abscesses and of the occurrence of fatal hemorrhage resulting from incisions. The family antecedents and tests of coagulating power of blood will reveal the tendency to hemophilia. The first manifestations generally appear before the age of two and the hemophiliacs generally outgrow the tendency by twenty-two. It rarely happens that a hemophiliac succumbs to hemorrhage after twenty-two. The most threatening hemorrhages are during teething or at puberty. The skin covering a hematoma is stretched, shiny, and bluish or black, with a peripheral red zone. These hematomata never suppurate, but the blood coagulated in them may undergo calcareous infiltration. The literature on hemophilia and the theories as to its mechanism are discussed in detail. Horse serum thus far has proved more effectual than anything else in the treatment of hemophiliac cases, but its action is only transient.

Bursitis.

Riedel[6] has made a study of an hygromatous affection of the bursa beneath the insertion of the semimembranosus tendon. The bursa does not as a rule communicate with the knee joint, but is separated from it by only a very thin membrane. From some unknown cause a serous or somewhat gelatinous exudate sometimes develops in this bursa, but this exudate is never as thick as the exudate of a tuberculous ganglion. Riedel estimates that in about one-third of the cases the thin membrane separating the bursa from the joint is ruptured by the exudate, and a chronic hydrops of the true joint may be set up. Great care must be exercised in excising the bursa, if opening the true joint is to be avoided.

PARALYSIS.

Decalcification of Bones in Paralyzed Limbs.

H. Claude and R. Porak[7] have studied the phenomenon of bone decalcification in cases of paralysis of the upper extremity occurring from various causes, *e.g.*, paralysis uncomplicated by neuritis, paralysis from wounds of the brachial plexus, paralysis from hysteria and disuse from simple immobilization. Their conclusions are in keeping with those of Legg[8] and others. They believe it cannot be regarded as pathognomonic of any nerve lesion, but that the mechanism of its production is identical with that which causes the wasting of muscles, hyperkeratosis, local sweating, etc., and attributable wholly and solely to disuse.

Poliomyelitis.

Sawyer[9] made a study of several groups of cases of epidemic poliomyelitis appearing in Northern California in the summer and fall of 1913. In many of the cases reported the infection can be explained on the theory that epidemic poliomyelitis is transmitted through contact from acute cases or carriers. The active virus of poliomyelitis was demonstrated by animal inoculation to be present in rectal washings obtained from a patient fourteen days after the beginning of the paralysis. Since the active virus may leave the body from the rectum, as well as from the nose and mouth, precautions should be taken in the care of the poliomyelitis patient to prevent infection, not only from the nasal and buccal discharges, but also from feces and soiled bedding.

Abramson,[10] as a result of his examination of the spinal fluid in 43 cases of poliomyelitis, believes that a study of the etiology helps to distinguish the abortive and preparalytic cases. No special help is afforded by this examination in the way of preventive or early treatment. Abramson states that the findings are often compatible with either poliomyelitis or tubercular meningitis, and lays emphasis upon the importance of the clinical signs, sudden onset, high fever, etc., in establishing the diagnosis. Thus far a study of the spinal fluid seems to offer little help in prognosis.

Francisco's[11] article on the early management of poliomyelitis is valuable in that it shows the great need which still exists of public education as to what is rational in the treatment of infantile paralysis. He investigated the previous treatment of thirty cases which came to his clinic and found that this treatment had been based on every type of ignorant and false advice. Some of it was mere quackery, there were many inefficient ready-made braces, and there was absolute neglect of treatment in other cases as a result of advice which had been given that "nothing could be done." Nearly all these cases were capable of being helped by operations or braces, but the great importance of the prevention of deformity was evident.

Gallie,[12] in his second paper, based on the results of 100 operative cases, feels justified in recommending the method of tendon fixation which he has advocated in cases of certain foot deformities and paralysis following poliomyelitis. He has discovered that it is necessary to remove the sheath of the tendon thoroughly before burying it in the groove made in the bone, else there is the possibility that the fixation will not be complete, the tendon moving in the sheath despite the fixation of the sheath to the bone.

Hoke and Hodgson,[13] as a result of their studies of the disabilities following poliomyelitis, believe that while tendon fixation, and perhaps the artificial silk ligaments of Lange, have their place in the treatment of the paralytic members, no operation on the soft parts is ever sufficient to hold the limb in good static position unless the bony skeleton is properly balanced. They, therefore, advocate bone operations whenever there is deformity or malposition of bones which would interfere with proper function or proper weight bearing.

[Ed. Note.—While the Editors are ready to admit the wisdom of bone operation in selected cases, they have been impressed with the amount of correction which may be obtained by tendon transplantation, tenodesis, silk ligaments, etc. Future growth may, perhaps, be expected to take care of a slight residual deformity if the operation succeeds in so balancing the foot that the resulting forces are exerted in a correcting direction.]

Biesalski[14] has operated on 9 cases of Little's disease; 3 four years old; 4 two and a half years old, 1 one year, 1 six months old, thus having a fairly long time of observation. The age was 5½ to 12½. He has operated only on the most severe cases, and emphasizes the importance of selecting only these cases for this operation, as otherwise the results might be credited to Foerster's operation, which could be obtained with much simpler methods. Biesalski describes the technic of the operation, which he always does in one session.

Hemiplegia.

Franz, Scheetz, and Wilson[15] report the results of massage, active and passive movements, in restoring motor function in old-standing cases of hemiplegia. From their observations it would appear that very considerable restoration of function can be obtained in many cases of hemiplegia by appropriate and persistent treatment. Their subjects were not altogether favorable, in that in several instances mental as well as physical impairment existed.

[Ed. Note.—The Editors wish to record, as they have done in previous Reports of Progress, their conviction that too little attempt is being made to ameliorate the depressing condition of these hemiplegic cases. A "shock" is looked upon by the public as an immediate forerunner of dissolution, and the immediate results of the shock are supposed to be permanent. Physicians, of course, know that often these patients live many years, and may die of an intercurrent disease without ever having another evident cerebral hemorrhage, and that often also very considerable recovery takes place. The years these patients do live will be much happier and more useful years if the idea of the hopelessness of the condition is combated, and the idea of a possible return of function under appropriate treatment and individual effort is fostered.]

Tardy Paralysis.

Ramsay Hunt[16] reports three cases of late paralysis due to chronic progressive ulnar neuritis, developing years after injuries to the elbow. These injuries had produced a valgus deformity and some change in the ulnar groove. The paralysis is apparently due to pressure irritation of the nerve. In one of his cases part of this pressure, at least, was due to a bursal cyst developing in the groove beneath the nerve. Excision of this cyst brought relief of the paralysis. The necessity of differentiating this condition from the progressive spinal atrophies is obvious.

BONE AND JOINT SURGERY.

Haas[17] has carried out a series of 75 experimental transplantations of the epiphysis. These consisted of eleven transplantations of an entire metacarpal or metatarsal, ten autotransplantations of the same, four reimplantations of split metacarpal or metatarsal, two autotransplantations of the same, six reimplantations of the epiphyseal cartilage, seven autotransplantations of the same, twelve reimplantations of varying lengths of the epiphyseal end of the metacarpal and metatarsal bones, twelve autotransplantations of the same, and ten two-stage autotransplantations of the same. The author draws the following general conclusions: 1. From the practically uniform failure of increase in length of the bones after transplantation of the epiphyseal cartilage, either alone or with an accompanying piece of the epiphysis and diaphysis, both in reimplantation and autotransplantation, it must be concluded that epiphyseal cartilage loses its power to function after such transplantations. 2. As the degenerative processes were more advanced in autotransplantation than in reimplantation, it can be almost certainly predicted that there would be a more marked degeneration in homotransplantation. 3. Whether a small- or large-sized transplant was taken was of no consequence, as there was the same failure of growth in every instance. Incision into the periosteum or boring holes into the cortex hastened the degenerative process. 4. There was marked disturbance of growth following the two-stage autotransplantation, in spite of the fact that osseous union was secured before severing the epiphyseal transplant from its surrounding and nourishing tissues. 5. The epiphyseal cartilage must be considered as a very vulnerable tissue, its viability being directly dependent upon its blood supply.

Bone Transplantation.

Horak[18] reports two cases of extensive osteoplasty of the humerus after removal of bone for sarcoma. In the first case the upper two-thirds were removed and a piece of the humerus of a seventeen-year-old girl, who had died from a gunshot wound in the head, substituted for the resected portion. The result was fairly good; the patient became able to move the shoulder up to the horizontal line, and to use the arm for eating and sewing. In another case the lower part of the diaphysis of the humerus was removed and a piece from the humerus of a young man who had died also from a gunshot wound in the head was implanted. Four days after the operation the patient showed symptoms of tetanus, from which he died. Tetanus bacilli were found in the marrow of the transplanted bone. This unfortunate occurrence makes evident the necessity for a most careful bacteriological examination of the blood and bone marrow in all homeoplastic operations in which the transplant has not been boiled. Küttner has already pointed out the importance of such examination.

Williams[19] reports an interesting case in which a giant cell sarcoma occurred in a man 27 years old, and 2⅜ inches of the lower end of the radius were excised. Two days later they obtained from a suicide the lower end of the radius, which was boiled an hour and kept in sterile salt solution for four days. This graft was applied and primary union took place. Subsequent x-rays showed the hand radially abducted and dislocation of the ulna. The function was poor and the hand grasps weak. The graft seemed to have acquired definite contact with the living bone.

[Ed. Note.—We have noticed this deformity and lack of good function in certain cases where similar operations have been done.]

Subperiosteal Resection in Osteomyelitis.

In a series of experiments in dogs, Phemister[20] finds that in young animals after subperiosteal resection of the shafts of the same bones that are most commonly affected by osteomyelitis in man, for example, the tibia and the humerus, there is usually a complete regeneration of the shaft. From his study of the specimens subsequently removed, it seems that the periosteum plays a certain part (osteogenetically) in the formation of the new bone, though the particles of bone remaining adherent to the periosteum after the removal of the shaft play a part also. In old dogs after subperiosteal resection, using the same technic, there was almost invariably failure of regeneration. Infection even in young animals greatly delayed or prevented the regeneration. Clinically, also, he finds that age is an important factor. He considers that "in view of the clinical and experimental data now at hand, showing the frequent failure of regeneration, subperiosteal resection should be reserved for selected cases of osteomyelitis in which there has been extensive necrosis of bone and particularly where this necrosis is located in areas inaccessible to operation, such as the posterior part of the tibia. Its use should be limited to parts of the body in which there is some other bony support (a so-called 'splinting' bone) and should almost never be used where there is only one bone in the extremity, as late sequestrectomy gives better results in such cases." The operation should not be performed too early, while the infection is severe, nor before a soft involucrum has formed. On the other hand, it should not be performed too late, after the involucrum is so ossified that an insufficient amount of osteogenetic tissue remains.

Excision of Transverse Process of Fifth Lumbar Vertebra.

Fassett[21] reports three cases in which an excision was done after other methods, such as fixation in various ways, had been tried. In these cases he exposed the process, either by direct incision through the erector spinae muscle or by a curved incision, turning back skin and muscle flaps toward the mid line. Removal was done by blunt dissection and chisel. Very material improvement resulted in all three cases. In one of these three cases symptoms developed on the other side subsequently, and the transverse process was removed on that side, but too little time had elapsed to admit of any conclusions. From these cases, and from others reported, it would seem that excision of the transverse process of the 5th lumbar must be considered in certain persistently painful backs of the type described.

Clarke[22] records an interesting case in which expert roentgenological interpretation had diagnosed a malignant sarcoma of the femur, but in which at the time of operation he was induced by the macroscopical appearance of the neoplasm, which suggested a "fibrous cyst," to withhold radical measures. After removal of the growth he approximated the parts with a bone graft and a long Lane plate. Subsequent pathological study confirmed the wisdom of his judgment.

[Ed. Note.—As Clarke says, it is most difficult at times to determine from the x-ray whether to call a bone tumor a cyst or a giant celled sarcoma, and the question we believe is still open as to just how many giant cells make it a sarcoma and just how definite a cavity must exist to call it a bone cyst. The "currant jelly" material and the many crossing and irregular trabeculae belong to more serious so-called giant celled sarcoma. As Bloodgood has shown, neither condition is malignant in the sense of metastasis. Both are usually capable of cure by local extirpation, and there is strong evidence to prove that many bone cysts "cure themselves," especially if they are broken, and certain evidence to suggest that occasionally an apparently typical giant celled sarcoma may disappear without radical excision. Fortunately, periosteal sarcomata are usually easy to differentiate in the x-ray from the less malignant form, but Clarke's article certainly emphasizes the necessity of most careful investigation as to the malignancy of bone tumors before amputations are performed, especially since the percentage of recurrences in the periosteal sarcomata is so high, even after most radical procedures.]

Pseudarthrosis of the Forearm.

Novë-Josserand[23] has observed that pseudarthrosis of the forearm does not as a rule occur when both bones are fractured, while it is most common in compound fractures of the radius or the ulna alone with loss of substance.

The author considers the separation between the ends of the bone the cause of non-union, and where the gap is less than 4 cm. recommends shortening the intact bone by an oblique cut, and thoroughly freeing and freshening the ends of the non-united bone and bringing them into apposition.

Irrigation of Joints.

Churchman,[24] after laboratory experimentation, has developed a technic by which joints may be irrigated thoroughly and repeatedly under local anesthesia. His apparatus, which consists of a series of aspiration bottles, is described, and he believes that he has benefited thus a few cases of tuberculous and Neisser joints.

RICKETS.

Baumann[25] describes a case of so-called myopathia rachitica, an affection of the muscles in rickets, which has been known since 1904 through the studies of Hagenbach-Burckhardt, but which has not found very common consideration in literature. The case of Baumann's was a child of about three months, with typical signs of rickets. There was thickening of the epiphysis in both forearms, and both arms were paretic; there were no motions noticeable in the left hand, and only very weak and slow motion in the right hand. There was hyperextension of the elbow. When the arms were elevated, they fell down as though paralyzed, but fell in a more retarded manner. The muscles seemed to be tender. The electrical examination showed very considerable decrease in the electrical irritability by the faradic, as well as the galvanic current, but the changes were only quantitative and not qualitative. Under physical therapy the conditions improved. Indeed, it has been stated that physical therapy is of such benefit in these cases that the affection of muscles is often cured before there is any apparent change in the bony signs. Baumann presents illustrations of histological findings of another case, which show a very indistinct structure of the muscle fibres. In severe cases the cross stripes are particularly indistinct, while the longitudinal stripes are still seen. The kernels are enormously augmented in number. The differential diagnoses must include: 1. Acute polymyositis. 2. Polyneuritis. 3. Paralysis following acute infectious diseases. 4. Antero-poliomyelitis. 5. Myotonia congenita. 6. Secondary muscular atrophy. 7. Idiocy and myxedema.

(To be continued.)

* * *

PROGRESS OF POLIOMYELITIS EPIDEMICS.—On August 25 the number of cases in the New York epidemic of poliomyelitis reached a total of 7,621, with 1,785 deaths. In Massachusetts on that date, the total number of cases since August 1st was 203, of which 38 have been in Boston. There have been 328 cases in this State since January 1, 1916.

Book Reviews.

Emergency Surgery. By JOHN W. SLUSS, A.M., M.D., Associate Professor of Surgery, Indiana University School of Medicine; Ex-Superintendent Indianapolis City Hospital; Surgeon to the City Hospital. Third edition, revised and enlarged with 685 illustrations, some of which are printed in colors. Philadelphia: P. Blakiston's Son & Co. 1915.

This is a small book of 800 pages, well bound, well printed and illustrated. In the preface to this third edition, the author remarks that he has "adhered to the aim of former editions to present general principles concisely, and practical details amply—in short to make a book useful to the general practitioner in the surgical phase of his daily routine." Besides a careful general revision, the subject matter of Fractures has in this new edition been increased —and War Surgery rewritten. The book seems to be a good compilation of standard works, without bibliography. It has, in common with similar books, a tendency to help the untrained general practitioner to believe that surgery is really easy and may be done safely by almost any doctor. It is an open question whether such books do more harm than good, especially when, like this one, they are attractive in appearance and dogmatic in statement.

Practical Cystoscopy and the Diagnosis of Surgical Diseases of the Kidneys and Urinary Bladder. By PAUL M. PILCHER, M.D., Consulting Surgeon to the Eastern Long Island Hospital. Second edition, thoroughly revised and enlarged. Octavo of 504 pages, with 299 illustrations, 29 in colors. Philadelphia and London: W. B. Saunders Company. 1915.

The first edition of this book was published four years ago. The demand for a new edition has brought out the present volume,—a book twenty-five per cent. larger than its predecessor, thoroughly revised, and brought up to date by the rewriting of several chapters, notably those on "Diseases of the Prostate" and on "Functional Activity of the Kidneys." A new section of twenty-five pages on Pyelography has been added. The final chapters of the book, devoted to "Therapeutic Uses of the Cystoscope" have been greatly amplified. They contain among other new work, a detailed description of the use of the high frequency current in the treatment of bladder tumors.

The publishers have maintained the high standard of paper, type and illustration which made the first edition so attractive, and the book continues to be, as was its first edition, an example for other writers to follow.

THE BOSTON
Medical and Surgical Journal
Established in 1812

An independently owned Journal of Medicine and Surgery, published weekly, under the direction of the Editors and an Advisory Committee, by the BOSTON MEDICAL AND SURGICAL JOURNAL SOCIETY, INC.

THURSDAY, AUGUST 31, 1916

EDITORS.
ROBERT M. GREEN, M.D., *Editor-in-Chief.*
GEORGE G. SMITH, M.D., *Assistant Editor.*
WALTER L. BURRAGE, M.D. *For the Massachusetts Medical Society.*

COMMITTEE OF CONSULTING EDITORS.
WALTER B. CANNON, M.D.
HARVEY CUSHING, M.D.
DAVID L. EDSALL, M.D.
REID HUNT, M.D.
ROGER I. LEE, M.D.
ALLAN J. MCLAUGHLIN, M.D.
ROBERT B. OSGOOD, M.D.
MILTON J. ROSENAU, M.D.
EDWARD C. STREETER, M.D.
E. W. TAYLOR, M.D.

ADVISORY COMMITTEE.
EDWARD C. STREETER, M.D., Boston, *Chairman.*
WALTER P. BOWERS, M.D., Clinton.
ALGERNON COOLIDGE, M.D., Boston.
HOMER GAGE, M.D., Worcester.
JOEL E. GOLDTHWAIT, M.D., Boston.
LYMAN A. JONES, M.D., Boston.
ROBERT B. OSGOOD, M.D., Boston.
HUGH WILLIAMS, M.D., Boston.
ALFRED WORCESTER, M.D., Waltham.

SUBSCRIPTION TERMS: $5.00 *per year, in advance, postage paid, for the United States.* $6.56 *per year for all foreign countries belonging to the Postal Union.*

An editor will be in the editorial office daily, except Sunday, from twelve to one-thirty p. m.

Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 Massachusetts Ave., Boston. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish one hundred reprints free to the author, upon his written request.

The Journal does not hold itself responsible for any opinions or sentiments advanced by any contributor in any article published in its columns.

All letters containing business communications, or referring to the publication, subscription, or advertising department of the Journal, should be addressed to

ERNEST GREGORY, *Manager,*
126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE LATEST THING IN CRUTCHES.

NECESSITY is the mother of invention and war is the mother of necessity. Therefore, war is the grandmother of invention and certainly the present war has seen a great many grandchildren, most of whom exemplify the saying that heredity skips a generation by being quite martial in nature. One of the latest products of the war is the ingenious device of a French engineer by the name of Schlick, to take the place of the old style crutch slung under the armpit.

The disadvantages of this aid to locomotion have always been obvious. The weight and pressure, coming as they did in the axillary region, a spot not designed by nature for them, caused in some individuals boils, in others pareses as the result of pressure on the large nerve trunks. Then, too, practically all weight was taken off the injured limb, which was prejudicial to the recovery of function.

The new invention resembles a walking stick with a horizontal handle. Above the handle is a spring rest sloped to fit the forearm. In use part of the body weight on that side falls upon the hand and wrist, the rest is borne by the injured leg and the balance of the weight can be shifted back and forth as conditions require.

This crutch has been on trial about a year now and has been commended very highly by wounded soldiers who have tried it. It is said to be so simple and natural in its application, that proficiency in its use can be acquired in half an hour.

Preparedness should certainly include a familiarity with the merits of this new crutch; for, should war come, not the least of its problems would be the care of the crippled.

* * *

THE EFFECT OF THE WAR ON THE YOUNGER GENERATION IN GERMANY.

IN view of the many conflicting statements which have appeared relative to the effectiveness of the Allied Forces' blockade, it is interesting to hear a report which appears to be impartial, being gloomy in spite of coming from a German source. Dr. A. H. Kettner, school medical officer in Charlottenburg, takes rather a pessimistic view of the health of the school children in his district. He states that it was only half a year after the opening of the war that the adults of the working classes became underfed. At first the children did not suffer, as their parents made sacrifices for them, believing that the war would be of short duration. Then, too, the government subsidized nursing mothers, which relieved the situation somewhat.

Dr. Kettner's present report is especially interesting for the reason that in the spring of 1915, he stated that the war had made no difference in the health or development of the children. But later on he was obliged to revise this opinion when the children were weighed and measured, as is done annually. Increase both in height and weight was found to be checked, particularly among the girls. Dr. Kettner also reports an increase in two diseases of children, rickets and tetany. The former was, of course, easily accounted for by the poorer food supply since the war; the latter is supposed to be due in a large measure to the effect of the excitement of war upon the pregnant mother.

The above report, emanating as it does from a German official, contrasting no doubt with what he would prefer to report and directly opposite to his previously expressed opinion, must be given considerable weight. It would seem to show that, while the Central Powers are able to feed themselves indefinitely, the nutritional quality of their subsistence must be somewhat impaired as a result of the state of war existing, and this deficiency will be felt more keenly where there is the least resistance, that is, among the younger generation.

MEDICAL ASPECTS OF SHAKESPEARE'S GENIUS.

The recent observance of the tercentenary of Shakespeare's death has recalled to the public mind, not only the poet himself and his works, too often neglected, or even forgotten, but also many of the books and comments that have been made or written about him. Among the many aspects of Shakespeare's genius which have been thus reviewed and considered, naturally the most pertinent to our profession is that which deals with his medical knowledge and references. Much on this subject has been written in time past; and without attempting a complete review of this literature, we may refer briefly to a few of the former and recent articles which have appeared on this topic.

In 1906 Dr. John W. Wainwright of New York published an admirable monograph consisting of a compilation of quotations from Shakespeare's plays illustrating the author's medical and surgical knowledge. This work of avocation by a busy physician constitutes a valuable contribution, which only one with a professional training could make, to the elucidation of many Shakespearean quotations and to our knowledge of the poet himself and of his mental and scientific background.

In the issue of the Journal of January 17, 1907 (Vol. clvi, p. 65), is a further contribution by a physician, Dr. Albert C. Getchell of Worcester, Mass., on "The Medical Knowledge of Shakespeare," which presents, in a similar fashion to that of Dr. Wainwright, a series of grouped quotations illustrating Shakespeare's knowledge of medicine and surgery. We cannot do better than to refer readers to these two publications for complete perusal. In the issue of the Journal for April 18, 1912 (Vol. clxvi, p. 603), we also commented editorially on Shakespeare as a medical observer, calling attention particularly to the astounding accuracy of his scientific as well as his artistic perceptions.

In an issue of the *Westminster Review* some years ago, and not now available for verification of the reference, was an article by Dr. John Knott on "The Medical Knowledge of Shakespeare" in which he cites the following quotations as evidence that Shakespeare's knowledge of the circulation of the blood was really in advance of Harvey's demonstration.

"The second property of your excellent sherris is the warming of the blood, which, before cold and settled, left the liver white and pale, which is the badge of pusillanimity and cowardice; but the sherris warms it and makes it course from the inwards to the parts extreme. It illumineth the face, which, as a beacon, gives warning to all the rest of this little kingdom, man, to arm, and then the vital commoners, and inland petty spirits, muster me all to their captain, the heart; who, great and puffed up with his retinue, doth any deed of courage; and this value comes of sherris. . . "

In the play of Coriolanus, the stomach, replying to the attacks of its enemies, proceeds to say:

"True is it, my incorporate friends," quoth he,
"That I received the general food at first,
Which you do live upon; and fit it is,
Because I am the store-house and the shop
Of the whole body; but, if you do remember
I sent it through the veins of your blood,
Even to the court, the heart; to the seat o' the brain;
And through the cranks and offices of man,
The strongest nerves and small inferior veins
From me receive that natural competency
Whereby they live."

Another medical aspect is that of Shakespeare's doctors, which was excellently discussed some years ago in a paper by Dr. P. S. Donnellan of Philadelphia, to which the reference cannot now be found. Dr. Donnellan pointed out that,

"Shakespeare's references to the medical profession are characterized by almost unvarying respect; indeed, it would be difficult to find in the works of any non-medical author a higher ideal of the physician and his calling than he gives us. Only in two well-known instances does he hold the physican up to ridicule. Once, in "The 'Merry Wives of Windsor,' in the character of Dr. Caius, whom Dame Quickly declares is a combination of the fool and the physician, and who is supposed to be a burlesque on Sir Theodore Mayerne, a French doctor who was expelled from the College of Physicians in Paris in 1603 because of his 'rashness, impudence and ignorance of true physick.' The second instance is that of Dr. Butts in 'Henry VIII,' but he is shown as a courtier rather than a physician.

"The physicians who were the creations of Shakespeare's brain were portrayed as men of high character and skilled in the practice of their time. In 'Lear' the doctor is an expert alienist and neurologist, and manages the case of the demented monarch with such tenderness and skill as to earn the gratitude of the devoted Cordelia. In 'Macbeth,' the physician who is called upon to attend Lady Macbeth in her mental collapse following the murder of 'the unguarded Duncan,' proves himself at once a shrewd Scotsman and a tactful practitioner. Before he undertakes 'to minister to a mind diseased' or 'pluck from the brain a rooted sorrow,' he cautiously finds out from her gentlewoman-in-waiting the exact condition of his royal patient, and honestly admits 'she more needs the divine than the physician' to soothe her distressed conscience; that her disease is beyond his practice, and after giving her attendants some good advice to watch her carefully and 'remove from her the means of all annoyance,' he prudently withdraws."

In England the occasion of Shakespeare's tercentenary was chosen by Dr. Sir St. Clair Thomson to deliver the 141st annual oration of the Medical Society of London, May 1, 1916, on "Shakespeare and Medicine." This oration was quoted and reviewed at some length in *The Medical Press and Circular.*

"In Shakespeare's time, medical science was but emerging from the chaos of unlicensed and irregular practice, and the marriage of his eldest daughter, Susanna, to Dr. John Hall, of Stratford, afforded his keen observation the requisite opportunity to note the habits and ways of thought of medical men. Quacks, male and female, flourished then as now, and such practice was indeed encouraged by the fact that the regular physician was apt to cease attendance on a case he considered incurable, to save his reputation. Physic failed to minister to a mind diseased, to pluck from the memory a rooted sorrow, and to raze out the written tablets of the brain (Macbeth), and an allusion to auto-suggestion may be read into the recommendation of the patient to 'minister to himself.'

"The works of Shakespeare contain references to ague, rheumatism, plagues, pestilence, fever, measles, 'the sweat,' leprosy, apoplexy, bone-ache, colic, consumption, convulsions, cramps, dropsy, ecstasy, epilepsy, gout, green sickness (chlorosis), heartburn, hemiplegia, hydrophobia, itch, jaundice, palsy, sciatica, seasickness, somnambulism, and visual spectra.

"The poet shared the common belief that vital spirits dwell in the arteries, and that wound trouble is attributable to the access of air, an interesting observation regarding sepsis which recalls Lister's carbolic spray. His references to the circulation of the blood (in 'Hamlet' and 'Measure for Measure' notably) are prophetic, seeing that Harvey did not reach his famous conclusion until a week before Shakespeare's death. The social disease, on which a Royal Commission has recently reported, was known in Shakespeare's day variously as 'the French disease,' and 'the Neapolitan disease.' Great as was his belief in the benefits of fresh air, he still regarded night air as harmful:

"'And will he steal out of his wholesome bed
To dare the vile contagion of the night.'

"The passage in 'Macbeth':

"'. . . Macduff was from his mother's womb
Untimely ripp'd,'

seems to indicate the practice at that time of Caesarean section.

"Shakespeare was deeply interested in mental pathology. He shows surprising knowledge of the mental confusion preceding an epileptic attack, and of the ensuing maniacal excitement. He alludes to the value of music in sickness, but hints the influence is not always beneficial, for he states that enuresis may result from the sound of the bagpipes. We believe this is not unknown in enemy ranks when Scottish regiments get to work. And the untutored Southron says there is no music in the bagpipes! The genius of our greatest Englishman is clearly revealed in his insight into mental and nervous disorders, as witness the neurasthenia of Hamlet, the melancholy of Jaques, the coxcombry of Malvolio, the hallucinations of Macbeth, the insane ambition of Lady Macbeth, the insanity of Ophelia, the maniacal misanthropy of Timon of Athens, the blind fury of Othello, the frenzy of Constance, the mania of King Lear, and the foolish imbecility of Simple, Shallow, and Speed. In 'As You Like It' we get a good idea of the way in which bad cases of madness were treated (the mild cases were not segregated).

"'Love is merely a madness, and I tell you, deserves as well a dark house and a whip as madmen do.'

"In 'Much Ado about Nothing' we find a foreshadowing of the principles which underlie the modern and kindly treatment of the mentally afflicted."

The issue of the *British Medical Journal* for May 6 contains a further report of Dr. Thomson's address, particularly with reference to the character of Shakespeare's physicians.

"Out of thirty-six plays, medical characters were represented six times: (1) Dr. Caius in the 'Merry Wives of Windsor'; (2) an English doctor; and (3) a Scottish doctor in 'Macbeth'; (4) Dr. Butts in 'Henry VIII'; (5) Cornelius in 'Cymbeline'; and (6) the physician in 'King Lear.' No character represented a surgeon. Dr. Caius was treated more as a figure of fun than as a regular physician, and it was probable that Shakespeare meant to represent a quack and not the learned Dr. Caius. Dr. Cornelius was possibly suggested by the famous physician of Charles V and simply adapted for dramatic purposes. The Dr. Butts represented in the fifth act of 'Henry VIII' was no doubt Dr. William Butts, Fellow of Gonville Hall, Cambridge, and of the College of Physicians, who lies buried in Fulham Church. Cornelius played with honour and astuteness a difficult part when the Queen asked him for poison, and the physician of King Lear played his part well and sympathetically. Cerimon in 'Pericles' was both a physician and a nobleman, so that the good social status of the medical man was here accepted and illustrated. No nobler panegyric of our profession could be written than that put in the mouth of Cerimon.

"Quacks, who flourished abundantly in the period, were portrayed in several plays. Among such characters were Pinch, Friar Lawrence, and Helena. Quacks and medical mountebanks were found in the earlier plays, and the first practitioner of medicine for whom Shakespeare did not entertain contempt was the physician in 'King Lear,' which was written about 1606, the year before the poet's daughter married Dr. Hall."

Finally, in the issue of the *Scientific Monthly* for June, 1916, has been published an article by Dr. James Frederick Rogers, of New Haven, Conn., on "Shakespeare as a Health Teacher." It is still another aspect from which this many-sided genius may be considered, to regard him as an early proponent of personal and communal hygiene. Though not in any sense, however, a student of sanitation, it is obvious that for his generation he had a keen insight into the nature of physical and mental health, and the causes and habits that may improve, maintain or injure it. Dr. Rogers illustrates these propositions also by quotations from the plays, and concludes that Shakespeare was, in the most important sense, a teacher of hygiene, standing among the foremost in the goodly company of non-professional writers, such as Plato, Cervantes, Molière, Montaigne, Bacon, Locke, Addison, Franklin, Carlyle, Spencer and others, "who, by both precept and practice, have been our greatest preachers of the gospel of health."

MEDICAL NOTES.

Progress of Poliomyelitis.—In the issue of the Journal for August 17, we discussed editorially the use of immune serum from recently recovered cases in the treatment of acute poliomyelitis. Report from New York on August 15, states that Dr. Abram Ziegler, of the Willard Parker Memorial Hospital in that city, advocates the similar use of normal serum from parents.

Report from Toronto, Canada, on August 15, states that poliomyelitis is increasing in prevalence in the province of Ontario. During June, 1916, there were two cases and no deaths; in July, eleven cases and two deaths; and during the first fortnight of August, eight new cases of the disease were reported. Of all Canadian provinces, Ontario is in most immediate communication with New York and Chicago.

Report from London on August 15 states that poliomyelitis is at present also epidemic in Aberdeen, Scotland, where 39 cases have occurred since July 1.

Occupational Diseases.—At the meeting of the American Chemical Society in New York on September 25 to 30, there will be conducted a symposium on Occupational Diseases, presided over by Professor Charles Baskerville, head of the department of chemistry of the College of the City of New York.

The symposium will consider the chemical trades, prophylaxis in chemical industry, diseases incidental to work in aniline and other coal tar products, cedar lumber, mines, explosives, and a general discussion by the leading authorities of the country. These will include Drs. W. Gilman Thompson, F. L. Hofman, J. W. Schereshewsky, G. P. Adamson, H. N. Benson, W. A. Lynott, Alice Hamilton and Mr. J. B. Andrews.

The Cartwright Lectures.—The Cartwright Lectures for 1916 of the Association of the Alumni of the College of Physicians and Surgeons, Columbia University, will be given by Dr. Richard M. Pearce, professor of research medicine, University of Pennsylvania, on October 24 and 25. Professor Pearce's subject will be, "The Spleen in Its Relation to Blood Destruction and Regeneration."

Dr. Welch Sails for England.—Dr. William H. Welch sailed from New York on August 6 for England, to make studies in connection with the organization of the school of hygiene and public health established by the Rockefeller Foundation at the Johns Hopkins University. Dr. Welch will also study, as president of the National Academy of Sciences, the manner in which England has been organized in scientific lines for the war. He is accompanied by Dr. George Ellery Hale, chairman of the committee of the academy on scientific organization.

European War Notes.

Germany and Red Cross Supplies.—In last week's issue of the Journal, we noted at length the refusal of the British Government to permit the passage of Red Cross supplies from America to the Central Empires. On August 9, the German Government issued the following memorandum, outlining its future policy towards such supplies destined for the Allied Powers, in view of this refusal:

"Great Britain, although she had originally assented to safe passage of such articles, having declined to accept the proposals of the American and Spanish governments, having even refused to allow the American Red Cross organization to dispatch them to the German Red Cross Society, and having further declined to listen to a protest from former President Taft on the subject, Germany is no longer in a position to grant free passage of surgical and medical requisites coming within the power of her naval forces, as she has done up to now. The German navy will receive orders to exercise in the future the right pertaining to it to requisition the medical and surgical requisites mentioned in the Spanish government's list for the use of German military forces."

MEXICAN NOTES.

The American Red Cross has been informed by the War Department that the Quartermaster's Department will make a gratuitous issue of colored glasses, or goggles, to the troops on the Border for the protection of their eyes from glare and sand. In view of this, Major-General Arthur Murray, Acting Chairman of the Central Committee, American Red Cross, announces that it will not be necessary for these to be contributed by Chapters or other Red Cross agencies.

BOSTON AND NEW ENGLAND

Harvard Surgical Unit.—Another reinforcement for the Harvard Surgical Unit at the front in France sailed from New York on August 17, aboard the steamer *Lapland*. The new detachment consisted of 11 surgeons and 11 nurses. Dr. Daniel Fiske Jones is the surgeon in charge.

Bequest.—By the will of Mrs. Josephine Angier Binney, of Providence, R. I., the Sharon Sanatorium has recently received a bequest of $3,000.

The Week's Death Rate In Boston.—During the week ending August 19, 1916, there were 222 deaths reported, with a rate of 15.22 per 1,000 population, as compared with 206 and a rate of 15.75 for the corresponding week of last year. There were 53 deaths under one year as compared with 51 last year, and 48 deaths over 60 years of age against 68 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria 38; Scarlet fever 8; Measles 23; Whooping cough 18; Typhoid fever 2; Tuberculosis 57.

Included in the above were the following cases of non-residents: Diphtheria 4; Scarlet fever 4; Tuberculosis 5.

Total deaths from these diseases were: Measles 5; Whooping cough 2; Tuberculosis 23; Anterior Poliomyelitis 4; Typhoid fever 1.

Included in the above were the following deaths of non-residents: Anterior Poliomyelitis 1; Measles 1; Tuberculosis 4.

Miscellany.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE THREE WEEKS ENDING AUGUST 12, 1916.

July 24.

P. A. Surgeon C. E. Strite, detached Aeronautic Station, Pensacola, Florida, to *Louisiana*.

P. A. Surgeon A. J. Toulon, to Aeronautic Station, Pensacola, Fla.

July 26.

Surgeon R. W. Plummer, detached *Hancock* to home, wait orders.

Asst. Surgeon James Watt, M.R.C., commissioned from June 28, 1916.

Asst. Surgeon W. W. Hawke, M.R.C., commissioned from July 5, 1916.

July 27.

Surgeon Harry Shaw, commissioned from May 28, 1915.

Asst. Surgeon R. M. Little, M.R.C., to Navy Recruiting Station, Peoria, Illinois.

From Commander-in-Chief, Asiatic Fleet,
Shanghai, China.

August 2.

P. A. Surgeon D. C. Walton, detached Naval Hospital, Canacao, P. I., to *Wilmington*.

Asst. Surgeon L. H. Boddis, detached *Elcano* to Naval Hospital, Canacao, P. I.

Asst. Surgeon Talmadge Wilson, detached *Wilmington* to *Elcano*.

August 5.

Asst. Surgeon W. J. Rogers, detached Marine Barracks, Pensacola, Florida.

August 8.

Surgeon J. C. Pryor, detached Naval Hospital, Annapolis, Md., to home and wait orders.

◆

NOTICES.

New York and New England Association of Railway Surgeons.—The twenty-sixth annual session of the New York and New England Association of Railway Surgeons will be held at the Hotel McAlpin, New York City, on Wednesday, Oct. 18, 1916. A very interesting and attractive program has been arranged. Dr. William S. Bainbridge will deliver the "Address in Surgery," on the cancer problem. Railway surgeons, attorneys and officials and all members of the medical profession are cordially invited to attend.

Dr. D. H. Lake,
President,
Kingston, Pa.

Dr. George Chaffee,
Corresponding Secretary,
Little Meadows, Pa.

Army Medical Corps Examinations.—The Surgeon-General of the Army announces that preliminary examinations for appointment of First Lieutenants in the Army Medical Corps will be held on September 5, 1916, at points to be hereafter designated.

Full information concerning these examinations can be procured upon application to the "Surgeon-General, U. S. Army, Washington, D. C." The essential requirements to secure an invitation are that the applicant shall be a citizen of the United States, shall be between 22 and 32 years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training as an interne, after graduation. The examinations will be held simultaneously throughout the country at points where boards can be convened. Due consideration will be given to localities from which applications are received, in order to lessen the travelling expenses of applicants as much as possible.

In order to perfect all necessary arrangements for the examinations, applications should be forwarded at once to the Adjutant General of the Army. There are at present over two hundred vacancies in the Medical Corps of the Army.

Examination for Navy Medical Corps.—The next examination for appointment in the Medical Corps of the Navy will be held on or about October 23, 1916, at Washington, D. C.; Boston, Mass.; New York, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Great Lakes (Chicago), Ill.; Mare Island, Cal.; and Puget Sound, Wash.

Applicants must be citizens of the United States and must submit satisfactory evidence of preliminary education and medical education.

The first stage of the examination is for appointment as assistant surgeon in the Medical Reserve Corps, and embraces the following subjects: (a) anatomy, (b) physiology, (c) materia medica and therapeutics, (d) general medicine, (e) general surgery, (f) obstetrics.

The successful candidate then attends the course of instruction at the Naval Medical School. During this course, he receives a salary of $2,000 per annum, with allowances for quarters, heat and light, and at the end of the course, if he successfully passes an examination in the subjects taught in the school, he is commissioned an assistant surgeon in the Navy to fill a vacancy.

Full information with regard to the physical and professional examinations, with instructions how to submit formal application, may be obtained by addressing the Surgeon-General of the Navy, Navy Department, Washington, D.C.

W. C. Braisted,
Surgeon-General, U. S. Navy.

APPOINTMENT.

Dr. Herbert R. Brown has resigned from the position of Assistant Director of the Massachusetts State Department of Health to accept an appointment as pathologist at the Rochester Homeopathic Hospital at Rochester, N. Y., the change becoming effective Sept. 1, 1916.

RECENT DEATHS.

Dr. Roscoe Smith, a graduate of Harvard Medical School in 1870, and a veteran of the Civil War, died at his home in Auburn, Me., July 8, aged 79 years.

Dr. Thomas A. Kenefick, of New York, who died on Aug. 1, at Lawrence, Mass., was born at that city in 1860. He received the degree of M.D. in 1885 from the New York College of Physicians and Surgeons, and since that time had practised his profession in New York City and at Newport, R. I. He was a member of the American Medical Association and the New York Academy of Medicine.

Dr. Frank Hammet Holt, superintendent of the Michael Reese Hospital, Chicago, died in that institution, of nephritis, August 3, 1916, aged 47 years. He was a graduate of the Massachusetts College of Pharmacy in 1895 and of the Harvard Medical School in 1899, then serving as house officer at the Boston City Hospital. There he was assistant superintendent from 1904 until April 15, 1915, when he went to Chicago. He was a Fellow of the Massachusetts Medical Society and of the American Medical Association.

Dr. Wentworth Larrabee Hayes, of Cambridge, died at South Yarmouth, August 13, 1916, of pneumonia, aged 39 years. He was a native of Gardiner, Me., and a graduate of Bowdoin College and of the Tufts College Medical School, the latter in 1900. He was a medical inspector of schools and a Fellow of the Massachusetts Medical Society. He is survived by his widow and two sons.

Dr. Joseph Logue Lockary, of Roxbury, died at St. Stephen, N. B., August 13, aged 45 years. He was a graduate of McGill University Medical Department in 1897 when he settled in Roxbury, joining the Massachusetts Medical Society in the following year, and had practised there since. He was a member of the Catholic Order of Foresters and of the Knights of Columbus. His wife died about five years ago, and he is survived by a young son and by five brothers and four sisters.

Dr. Edward L. Estabrook, of Minneapolis, died at the Corey Hill Hospital, Brookline, Mass., August 20, where he was taken when attacked with a sudden illness while spending a vacation in the East.

He was born in Camden, Me., July 13, 1845, and in early life served as a midshipman and later as a second lieutenant in the Civil War. He was on the *Kearsarge* at the time of its engagement with the *Alabama*. After the war he studied medicine at the University of New York, in Vienna and in Hamburg. While abroad he married Caroline Benedict of New York. He returned and settled in Minneapolis, where he remained in active practice until his death. He was a member of the Loyal Legion, the G. A. R., the Sons of the Revolution, the Masons and the Odd Fellows. He is survived by one son, Joseph Estabrook of Minneapolis.

Dr. Isador Lett, a prominent dental surgeon, died at his home, 340 Harvard Street, Brookline, Mass., Aug. 20, after an illness of six months. Dr. Lett, the son of Michael and Hannah (Hyneman) Lett, was born in New York City 41 years ago. When a child, he moved to Philadelphia with his parents and was educated in the schools of that city. He became interested in dentistry and entered the Philadelphia Dental College, graduating from that institution. He established offices in Philadelphia and held a large practice. He came to Boston about 18 years ago and had since practised in that city.

He was considered an authority on dental surgery and was an active member of numerous dental societies and an officer of Mt. Sinai Hospital. He is survived by his widow, three children, his mother and one brother.

Dr. William H. Baker, who died on Aug. 22, at Lynn, Mass., was born in West Chester, Pa., on June 7, 1844. He served in both the army and the navy during the Civil War, and for a decade after its close. He settled in the practice of his profession at Lynn in 1875. He was for many years president of the Board of United States Examining Surgeons, and was Surgeon-General of the Massachusetts Department, G. A. R.

Dr. Thomas Powell, who died recently at Los Angeles, Calif., was born in Tennessee, in 1837. He received the degree of M.D., from New York Medical College in 1858, and had practised his profession in Kentucky, Indiana, and California.

Dr. Benjamin Fagnant, a well-known French physician of Springfield, died at his home, Aug. 19, 1916, after a three-months' illness. He was born in Canada, in 1871, and was educated at Laval College, Montreal, but had been a resident of Springfield for the past 45 years, where he had been in practice practically all that period. He is survived by his widow and a son.